5-3895-272-12

TM 5-3895-272-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND
ORGANIZATIONAL MAINTENANCE MANUAL

ROLLER, MOTORIZED: GASOLINE ENGINE DRIVEN, 2 WHEEL, 5 TO 8 TON, W/SPRINKLER (HUBER MODEL T58M)

FSN 3895-842-5326

HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1967

D 101.11:

READEX FICHE best copy available

SAFETY PRECAUTIONS

BEFORE OPERATION

Never refuel the roller near an open flame or with the engine running.

Always provide a metal-to-metal contact between the container and tank when refueling.

Never attempt an adjustment of the roller with the engine running.

Be sure the operator's platform is free of oil, grease, ice or mud.

Be sure all operator's controls are in neutral position before starting the engine.

Check that the brakes are in good operating condition before starting operations.

Do not use a lifting device with a capacity of less than 30,000 pounds when lifting the roller. Do not allow the unit to swing while it is suspended. Failure to observe this warning may result in serious injury or death to personnel or damage to the equipment.

DURING OPERATION

Always stop the engine before making adjustments or repairs on any part of the roller.

Keep the roller in gear when going down grades. On very steep grades, use the brakes to prevent runaway speeds and damage to the torque converter.

Never mount or dismount while the roller is in motion.

Avoid breathing the smoke or vapor which is generated when using the fire extinguisher on a fire.

Do not operate the roller in an inclosed area without proper ventilation for the exhaust.

Never attempt an adjustment of the roller with the engine running.

AFTER OPERATION

Always provide a metal-to-metal contact between the container and fuel tank when refueling.

Always apply the parking brake when leaving the machine on an inclined surface.

Changes in Force: C 1 and C 3

*TM 5-3895-272-12
C 3

Change }
No. 3 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *10 October 1973*

Operator and Organizational Maintenance Manual
ROLLER, MOTORIZED; GASOLINE ENGINE DRIVEN; 2-WHEEL: 5 to 8 TON; W/SPRINKLER (HUBER MODEL T58M)
FSN 3895-842-5326

TM 5-3895-272-12, 17 October 1967, is changed as follows:

Page 1-1. Paragraph 1-1*d* is superseded as follows:

d. Recommendations for Maintenance Publications Improvements. You can improve this manual by calling attention to errors and by recommending improvements, using DA Form 2028 (Recommended Changes to Publications) or by a letter, and mailing direct to Commander, US Army Troop Support Command, ATTN: AMSTS-MP, 4300 Goodfellow Boulevard, St. Louis, Missouri 63120. A reply will be furnished direct to you.

Page 2-1, paragraph 2-3. Add subparagraph *f* after table 2-2.

f. Maintenance and Operating Supplies For Maintenance and Operating supplies see Table 3.

***This change supersedes C 2, 5 June 1972.**

Table 3. Maintenance and Operating Supplies

(1) Component application	(2) Federal stock number	(3) Description	(4) Quantity required f/initial operation	(5) Quantity required f/8 hrs operation	(6) Notes
0101 CRANKCASE		OIL, LUBRICATING			(1) Includes quantity of oil to fill engine oil system as follows:
(1)		5 gal pails as follows:			
	9150-265-9435	OE-30	5 qt	(3)	
	(2)				
	9150-265-9428	OE-10		(3)	5 qt–CRANKCASE
	(2)				
	9150-242-7603	OES		(3)	1 qt–oil filter
	(2)				
0203 TORQUE CONVERTER		OIL, LUBRICATING:	7-1/2 qt	(3)	(2) See C9100-IL for additional data and requisitioning procedure
		(4)			
		OE-10		(3)	
		OES		(3)	
0304 AIR CLEANER		OIL LUBRICATING:	1 qt		(3) See current LO for grade application and replenishment intervals.
		(4)			
		OE-30		(3)	
		OE-10		(3)	
		OES		(3)	
0306 TANK, FUEL		FUEL GASOLINE: bulk as follows:			(4) Use oil as prescribed in item 1
	9130-160-1818	Automotive combat 91A	25.5	40 gal (6)	
	9130-160-1830	Automotive, combat 91C	(5)		
0501 RADIATOR		WATER:	16 qt		(5) Tank capacity
		ANTIFREEZE: 5 gal cans as follows:			
	6850-224-8730	antifreeze	11 qt		
		ethylene			
		glycol			
		ANTIFREEZE: 55 gal drums as follows:			
	6850-174-1806	Antifreeze: compound, artic	16 qt		
0800 TRANSMISSION		LUBRICATING OIL GEAR 5 gal cans			(6) Average fuel consumption is 5.0 gal per hour of continuous operation.
		as follows:			
	9150-577-5844	GO-90	9 qt (5)	(3)	
	9150-257-6440	GOS		(3)	
1103 FINAL DRIVE GEARS	9150-234-5197 (2)	LUBRICATING, GEAR			
	9150-234-5199	5-lb can as follows:			
	(2)				
		CW-11A	5 lb	(3)	
		CW-11B	5 lb	(3)	
1413 HYDRAULIC SYSTEM		OIL, LUBRICATING: (4)			
		OE-10	26 qt (5)	(3)	
		OES			
		WATER	130 gal		
7471 SPRINKLER SUPPLY TANK					

Table 3. Maintenance and Operating Supplies–Continued

(1) Component application	(2) Federal stock number	(3) Description	(4) Quantity required f/initial operation	(5) Quantity required f/8 hrs operation	(6) Notes
GREASE POINTS	9150-190-0905 (2)	GREASE, AUTOMOTIVE AND ARTILLERY: (3) 5-lb. can as follows: GAA	5 lb	1 lb	

Page 3-1. Paragraph 3-1 is superseded as follows:

3-1. Special Tools and Equipment

A hydraulic tester (FSN 4910-868-6871) is required to test the hydraulic system pressure.

Page 3-58, paragraph 3-114. Add sub-paragraph *e.* and *f.*

e. Hydraulic Pressure Test.

(1) Pressure control valve test. Disconnect the hydraulic hose that fruns from hydraulic control valve to steering cylinder (cylinder end) (fig. 3-73) and install a pipe tee.

(2) Install the hydraulic tester at this point.

(3) Start engine then pull steering lever hard over (to either side) and hold or block in this position after cylinder piston has reached end of stroke, take pressure reading.

(4) If pressure reading is not 500 PSI adjust pressure valve in accordance with fig. 3-71. If 500 psi cannot be obtained test hydraulic pump (see para *f* below).

(5) Remove hydraulic tester reconnect hose on to cylinder.

f. Hydraulic Pump Pressure Test.

(1) Disconnect hydraulic output line at hydraulic pump (fig. 3-70) and install pipe tee.

(2) Install hydraulic tester at his point. Start engine and check pressure, it should be 500 to [illegible] PSI if the pump is working.

(3) If the pump pressure is not at least 500 PSI, replace pump.

Page B-1. Appendix B is superseded as follows:

APPENDIX B
BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST
Section I. INTRODUCTION

B-1. Scope

This appendix lists items required by the operator for operation of the roller.

B-2. General

This list is divided into the following sections:

a. Basic Issue Items List—Section II. Not applicable.

b. Items Troop Installed or Authorized List—Section III. A list of items in alphabetical sequence, which at the discretion of the unit commander may accompany the roller. These items are NOT SUBJECT TO TURN-IN with the roller when evacuated.

B-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items List, Section II, and Items Troop Installed or Authorized List, Section III.

a. Source, Maintenance, and Recoverability Code(s) (SMR):

(1) Source Code, Indicates the source for the listed item. Source codes are:

Code	*Explanation*
P	Repair parts, special tools and test equipment supplied from GSA/DSA or Army supply system and authorized for use at indicated maintenance levels.
P2	Repair parts, special tools and test equipment which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system

(2) Maintenance code, indicates the lowest level of maintenance authorized to install the listed item. The maintenance level codes is—

Code	*Explanation*
C	Crew/Operator

(3) Recoverability code, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are non-recoverable. Recoverability codes are:

Code	*Explanation*
R	Applied to repair parts (assemblies and components) special tools and test equipment which are considered economically reparable at direct and general support maintenance levels.
S	Repair parts, special tools, test equipment and assemblies which are economically reparable at DSU and GSU activities and which normally are furnished by supply on an exchange basis.

b. Federal Stock Number. This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. This column indicates the Federal item name and any additional description of the item required.

d. Unit of Measure (U/M). A 2-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Furnished With Equipment (BIIL). (Not applicable).

f. Quantity Authorized (Items Troop Installed or Authorized). This column indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) Smr code	(2) Federal stock number	(3) Description Ref No & mfr code / Usable on code	(4) Unit of meas	(5) Qty auth
	7520-559-9618	CASE, MAINTENANCE AND OPERATION MANUALS	EA	1
	4910-868-6871	TESTER, Hydraulic circuit, portable carrying case type 7x8-3/4x11, flow gage scale range 4.25 GPM 12-15 GPM temperature range 0 250 degree pressure gage 0-8000 PSI (FMC 08832) number PT100E.	EA	1

Page C-5. Group 1410 Pump and Pump Drive line 2 column 3B add "0"

Page C-6. Group 1414 Steering Systems Valves, Line 2 column 3B add "0"

Page C-7. Section III, column 2 add "0"; Column 3 is changed to read "Tester, hydraulic"; column 4 add "4910-868-6871."

Section IV, column 1 add "F-B", column 2 add "Test hydraulic control valve and hydraulic pump pressure."

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:
VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25B (qty rqr block No. 433) Operator's Maintenance requirements for Pavers, Bituminous.

TM 5-3895-272-12
C 1

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No. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *24 June 1968*

Operator and Organizational Maintenance Manual

ROLLER, MOTORIZED: GASOLINE ENGINE DRIVEN, 2 WHEEL, 5 TO 8 TON, W/SPRINKLER (HUBER MODEL T58M)

FSN 3895-842-5326

TM 5-3895-272-12, 17 October 1967, is changed as follows:

Page 3-1. Paragraph 3-3 is superseded as follows:

3-3. General Lubrication Information

a. Care of Lubricants. Keep all lubricants in sealed containers and store in a clean, dry place away from external heat. Allow no dirt, dust, water, or foreign material of any kind to mix with the lubricants. Keep all lubrication equipment clean and ready for use.

b. Cleaning. Keep all external parts not requiring lubrication, clean of lubricants. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after lubrication of excess grease to prevent the accumulation of dirt or foreign matter.

Paragraph 3-4*a* and 3-4*c* are rescinded.

Paragraph 3-4*c* (1) is superseded as follows:

(1) The points of lubrication will be covered in the current Lubrication Order. Follow the instructions and use the specified lubricants.

Page 3-3 and 3-4. Figure 3-1(1) and (2) are rescinded.

Page 3-10. Figure 3-6, item 11, paragraph reference "3-87" is changed to read "3-88."

Page 3-16. Paragraph 3-23, line 5. "(para 2-7)" is changed to read "(Para 3-10)."

Page 3-17. Paragraph 3-26, line 12. "Replace thermostat (para 3-75)" is changed to read "Replace thermostat (para 3-79)."

Paragraph 3-28, line 9. "(para 3-95)" is changed to read "(para 3-96)."

Page 3-25. Paragraph 3-63*b*(2) is superseded as follows:

(2) Replace a damaged or defective regulator as necessary.

Page 3-26. Paragraph 364*b*(2) is superseded as follows:

(2) Replace a worn, defective or damaged starter as necessary.

Paragraph 3-65*a* is superseded as follows:

a. Removal.

(1) Remove carburetor (para 3-55).

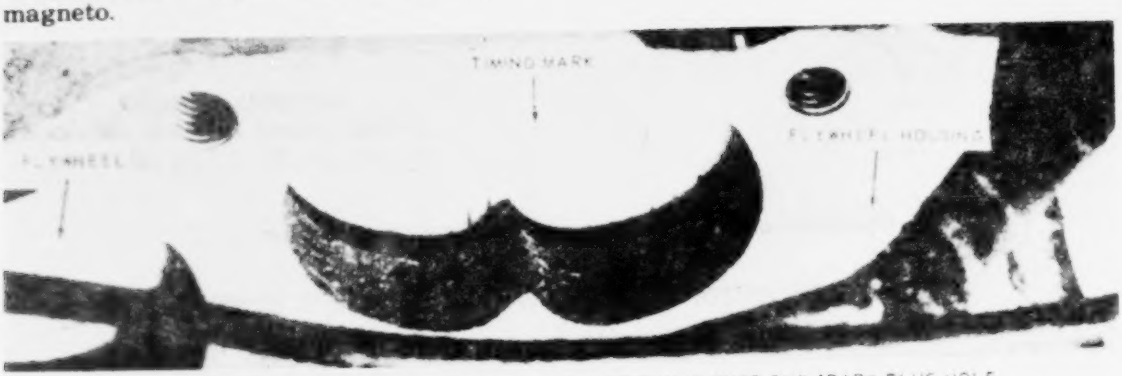
Note. The magneto can be removed without removing the carburetor but to do so necessitates partial disassembly of the magneto. To remove the magneto as a complete assembly, the carburetor must be removed.

(2) Refer to figure 3-31 and remove the magneto.

Page 3-27. Paragraph 3-65*f* is superseded as follows:

f. Installation and Timing.

(1) Refer to figure 3-33.1 and time the magneto.



STEP 1 REMOVE THE REAR SPARK PLUG (NO. 6). PLACE THUMB OVER THE SPARK PLUG HOLE AND CRANK ENGINE BY HAND UNTIL AIR IS EXHAUSTING.

STEP 2 SET PISTON ON TOP DEAD CENTER BY SLOWLY CRANKING UNTIL THE DC MARK ON FLYWHEEL WILL LINE UP WITH THE POINTER ON THE FLYWHEEL HOUSING.

STEP 3 WITH MAGNETO REMOVED FROM ENGINE, PUT IT FIRMLY IN A VICE, LINED WITH SOFT CLOTH, AND TURN DRIVE GEAR UNTIL LEAD TO NO. 6 PLUG FIRES.

NOTE NO. 6 PLUG LEAD IS AT 5 O'CLOCK POSITION WHEN FACING DISTRIBUTOR END.

STEP 4 TURN MAGNETO DRIVE GEAR COUNTERCLOCKWISE ABOUT 1/4 TURN SO AS TO MESH WITH THE CAMSHAFT GEAR.

STEP 5 CHECK FRONT END CAMSHAFT GEAR AND MAKE CERTAIN THAT PUNCH-MARKED TOOTH OF CAMSHAFT GEAR IS MESHING BETWEEN THE TWO PUNCH-MARKED TEETH OF THE MAGNETO DRIVE GEAR. (SEE FIG. 3-33)

STEP 6 POSITION MAGNETO ON ENGINE AND TIGHTEN MOUNTING BOLTS SLIGHTLY. CONNECT THE WIRES TO SPARK PLUGS.

STEP 7. START ENGINE AND IDLE AT 600 RPM. USE A TIMING LIGHT CONNECTED TO THE REAR PLUG AND BATTERY SOURCE AND CHECK TO SEE IF TIMING IS DIRECTLY AT "IGN•M" INDICATED BY POINTER. IF NOT, ROTATE MAGNETO UNTIL TIMING IS CORRECT. TIGHTEN MOUNTING BOLTS.

ME 3895-272-12/3-33.1 C

Figure 3-33.1. Timing the magneto

(2) Refer to figure 3-31 and complete installation of magneto.

(3) Install the carburetor (para 3-55).

g. *Magneto Gear Removal and Installation.* Refer to figure 3-33.2 and remove and install the magneto gear.

Note. Remove the coupling plate washer from under the coupling gear bushing before new gear is installed.

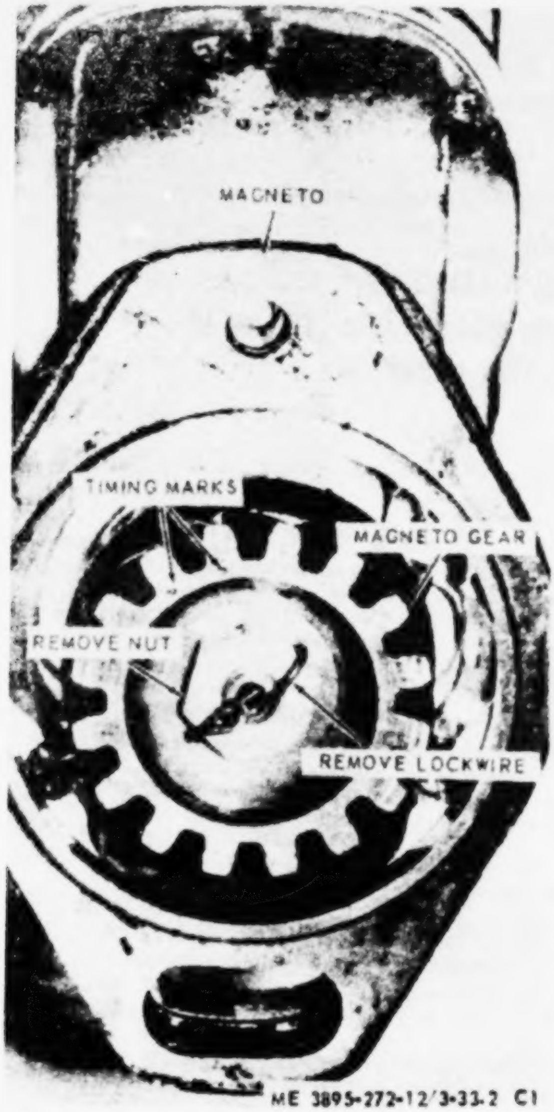


Figure 3-33.2. Magneto gear, removal and installation.

Page 3-29. Figure 3-33. The "A" portion of illustration is rescinded.

Page B-3. Section II. Source Codes. Delete all reference numbers in Materiel column. Delete Quantity issued with equipment column in its entirety.

Page C-3. Functional group 0108, column I, "O" is changed to read "F". Functional group 0301, line 2, Column D, "C" is changed to read "O".

Page C-4. Functional group 0504 is rescinded.

Functional group 0505, line 1, column I, "O" is changed to read "F".

Functional group 0602, line 1, column D, "O" is changed to read "F".

Page C-5. Functional group 0703, line 3, column D, "C", is changed to read "O".

Functional group 1202 is added after last line of 1201.

"1202 SERVICE BRAKES" Place "O" in columns D and H and "F" in column I.

Page C-7. Functional group 7603, line 2, add "C" to column A and delete "C" from column C.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army, ARNG, USAR:

To be distributed in accordance with DA Form 12-25 (qty rqr block no. 90) Section I, organizational maintenance requirements for Engines, Gasoline, 10-20 HP M.S.

TECHNICAL MANUAL
No. 5–3895–272–12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *17 October 1967*

Operator and Organizational Maintenance Manual

ROLLER, MOTORIZED: GASOLINE ENGINE DRIVEN, 2 WHEEL, 5 TO 8 TON W/SPRINKLER (HUBER MODEL T58M) FSN 3895–842–5326

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. These instructions are published for use by personnel to whom the Huber Model T58M Motorized Roller is issued. They provide information on the operation and organizational maintenance of the equipment. Also included are descriptions of main units and their functions in relationship to other components.

b. Appendix A contains a list of publications applicable to this manual. Appendix B contains the list of basic issue items authorized the operator of this equipment and the list of maintenance and operating supplies required for initial operation. Appendix C contains the maintenance allocation chart.

c. Numbers in parentheses following nomenclature callouts on illustrations indicate quantity; numbers preceding nomenclature callouts indicate preferred maintenance sequence.

d. Report of errors, ommissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Blvd., St. Louis, Mo. 63120.

e. Report all equipment improvement recommendations as prescribed by TM 38-750.

1-2. Record and Report Forms

a. DA Form 2028 (Depreservation Guide for Vehicles and Equipment).

b. For other record and report forms applicable to operator, crew and organizational maintenance, refer to TM 38-750.

Note. Applicable forms, excluding Standard Form 46 (United States Government Motor Vehicles Operator's Identification Card) which is carried by the operator, shall be kept in a canvas bag mounted on equipment.

Section II. DESCRIPTION AND TABULATED DATA

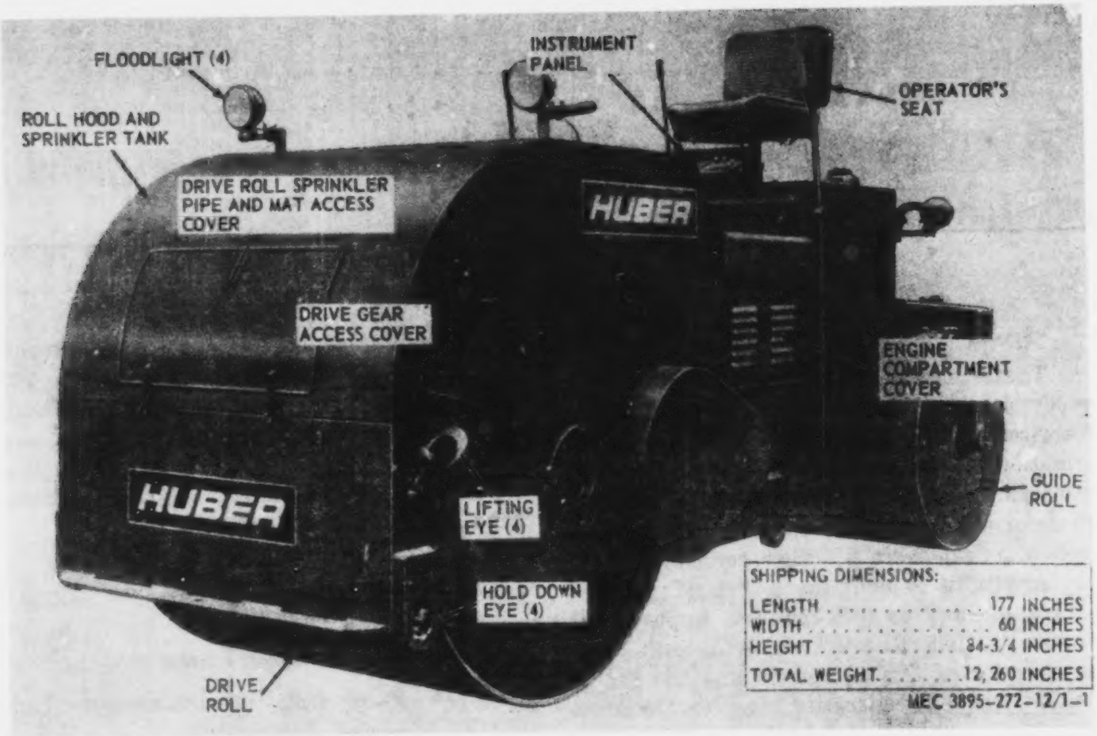
1-3. Description

a. General. The Huber Model T58M Motorized Roller covered by this manual is classed as a nominal five (5) to eight (8) ton roller for use in compacting materiels used in the construction and maintenance of public highways, secondary roads, air fields and other work of similar characteristics.

b. Engine. The roller is powered by a Continental gasoline engine Model FS244-6091. The engine is a 244 cubic inch displacement engine which is governed at a speed of 2,400 rpm (revolutions per minute), no load.

c. Torque Converter. The power of the engine is transmitted through a Borg and Beck torque converter directly to the forward and reverse clutches, thus eliminating the conventional master clutch.

d. Transmission. The Huber transmission has two speeds forward and two reverse. Power is transmitted from the forward and reverse clutches through the transmission and inter-


FLOODLIGHT (4)
ROLL HOOD AND SPRINKLER TANK
INSTRUMENT PANEL
OPERATOR'S SEAT
DRIVE ROLL SPRINKLER PIPE AND MAT ACCESS COVER
HUBER
DRIVE GEAR ACCESS COVER
ENGINE COMPARTMENT COVER
GUIDE ROLL
HUBER
LIFTING EYE (4)
HOLD DOWN EYE (4)
DRIVE ROLL
MEC 3895-272-12/1-1

SHIPPING DIMENSIONS:

LENGTH	177 INCHES
WIDTH	60 INCHES
HEIGHT	84-3/4 INCHES
TOTAL WEIGHT	12, 260 INCHES

Figure 1-1. Roller, motorized, left front, three-quarter view.

mediate gear assembly to the bull gear on the drive roll. Provisions are also made to mount the tailshaft governor and the service brake assemblies on the transmission.

e. Rolls. The roller is provided with one drive (compression) roll and a split guide (steering) roll. All rolls are of watertight construction for the introduction of water ballast only. Both rolls are supported by fixed, non-driving axles.

f. Steering System. The roller is steered by a completely hydraulic system consisting of a pump, single spool valve, hydraulic cylinder, filter, tank and necessary lines and fittings to complete the system. The system is activated by a single, hand operated control lever.

g. Sprinkler System. The sprinkler system is a gravity feed system manually controlled by two (2) foot pedals. The system consists of a water tank, two (2) gate valves, sprinkler tubes and necessary lines and fittings to complete the system. Cocoa mats are provided to evenly distribute the water across the rolls.

h. Controls. The roller is provided with dual controls so that it may be operated from either side of the operator's deck.

1-4. Identification and Tabulated data

a. Identification. The roller has 2 major identification plates. The information contained on the plates is listed below.

(1) *U.S. Army data plate.* Located on the right, front side of frame. Gives the make and model, contract number, serial number, Federal stock number, engine serial number, date of warranty, dimensions and weights for the Roller.

(2) *Transportation data plate.* Located on the right, front side of frame. Gives the weight, overall dimensions, and tie down instructions.

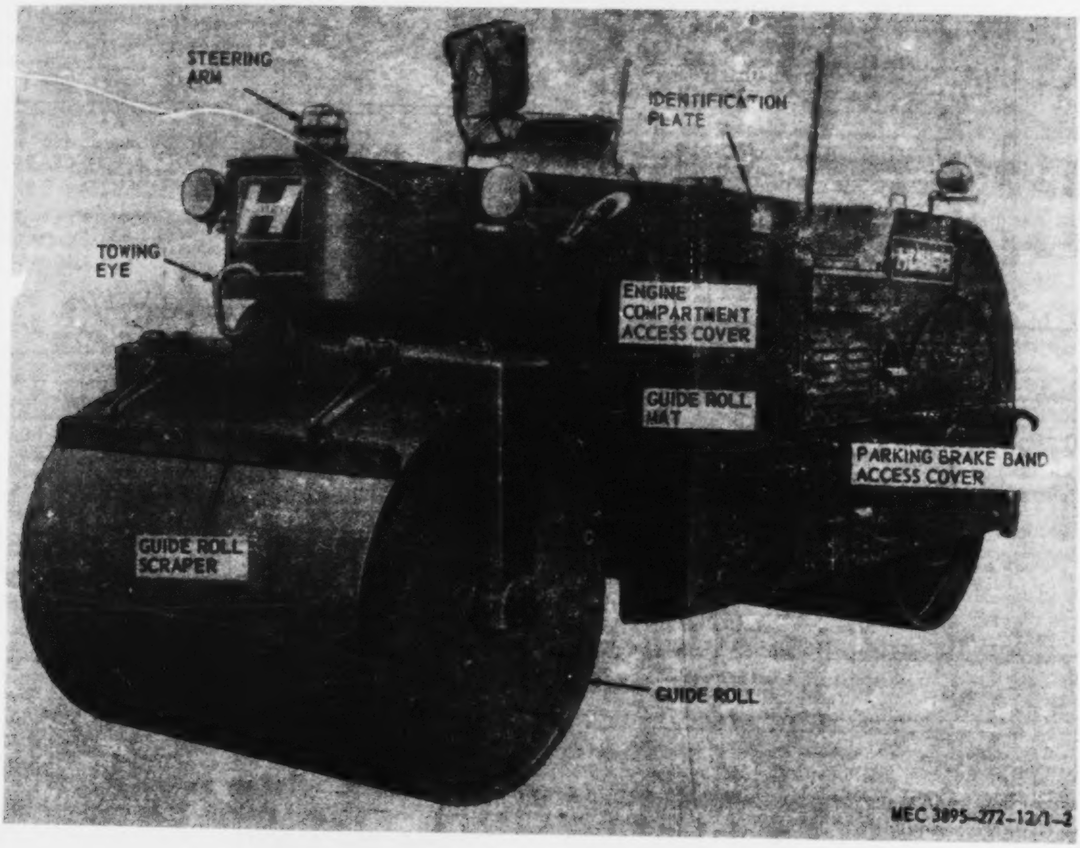

STEERING ARM
IDENTIFICATION PLATE
TOWING EYE
ENGINE COMPARTMENT ACCESS COVER
GUIDE ROLL MAT
PARKING BRAKE BAND ACCESS COVER
GUIDE ROLL SCRAPER
GUIDE ROLL
MEC 3895-272-12/1-2

Figure 1-2. Roller, motorized, right rear, three-quarter view.

b. Tabulated Data.

(1) *Road Roller.*

Manufacturer	Huber Corporation
Model	T-58-M
Type	Tandem
Rolls	Water ballast type
Electrical system	24 v. (volts) dc (direct current)
System ground	Negative

(2) *Engine*

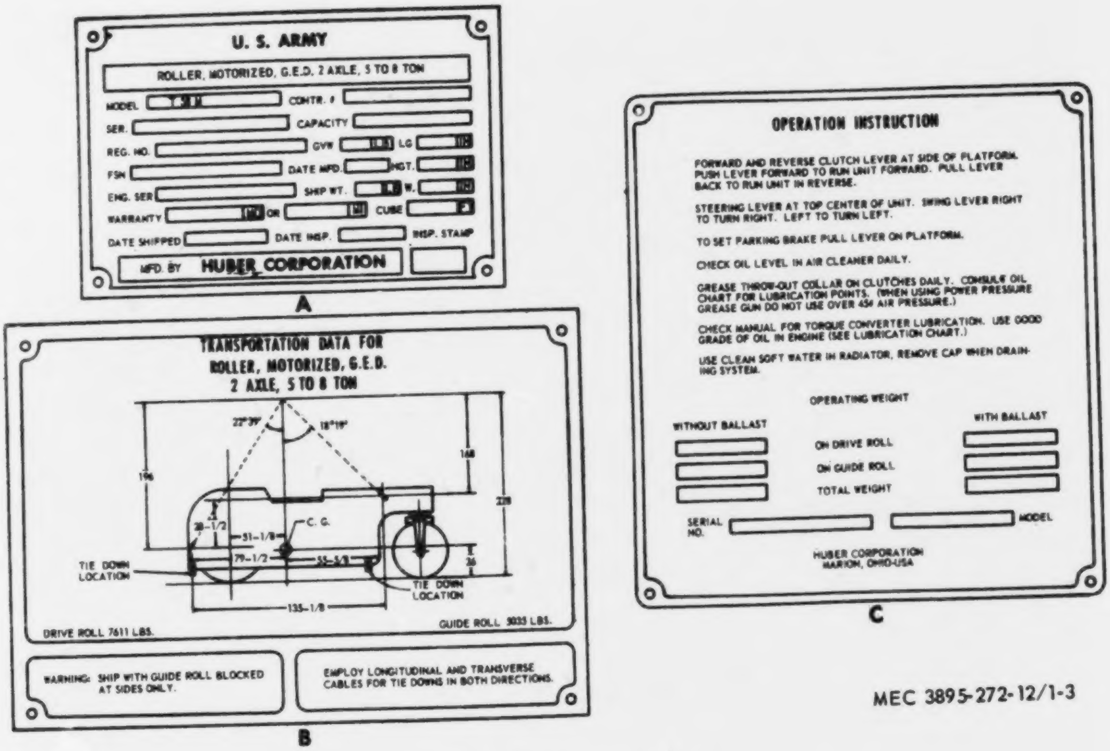
Manufacturer	Continental Motors Corporation
Model	FS-244-6091
Fuel	Gasoline
Type	L-Head
Number of cylinders	6
Bore and stroke	3 7/16 x 4 3/4 in. (inches)
Displacement	244 cu. in. (cubic inches)
Compression ratio	6.9
Maximum oil pressure	20—30 psi (pounds per square inch)
Minimum oil pressure	7 psi
Firing order	1-5-3-6-2-4
RPM (revolutions per minute) no load.	2,400
Horse power	43.8 at 2200 rpm

(3) *Transmission.*

Manufacturer	Huber Corporation
Type	Sliding gear
Speeds	
Low (frd & rev.)	0.5 to 3.5
High (frd & rev.)	0.7 to 5.75
Lubrication	Oil bath

(4) *Torque Converter.*

Manufacturer	Borg & Beck
Type	Single stage, 2 phase
Cooling	Water


U. S. ARMY
ROLLER, MOTORIZED, G.E.D. 2 AXLE, 5 TO 8 TON
MODEL
CONTR. #
SER.
CAPACITY
REG. NO.
GVW
LG
FSN
DATE MFD.
HGT.
ENG. SER
SHIP WT.
W.
WARRANTY
OR
CUBE
DATE SHIPPED
DATE INSP.
INSP. STAMP
MFD. BY HUBER CORPORATION
A
TRANSPORTATION DATA FOR
ROLLER, MOTORIZED, G.E.D.
2 AXLE, 5 TO 8 TON
22°39'
18°19'
196
168
228
28-1/2
31-1/8
C. G.
79-1/2
55-5/8
26
135-1/8
TIE DOWN LOCATION
TIE DOWN LOCATION
DRIVE ROLL 7611 LBS.
GUIDE ROLL 3033 LBS.
WARNING: SHIP WITH GUIDE ROLL BLOCKED AT SIDES ONLY.
EMPLOY LONGITUDINAL AND TRANSVERSE CABLES FOR TIE DOWNS IN BOTH DIRECTIONS.
B
OPERATION INSTRUCTION

FORWARD AND REVERSE CLUTCH LEVER AT SIDE OF PLATFORM. PUSH LEVER FORWARD TO RUN UNIT FORWARD. PULL LEVER BACK TO RUN UNIT IN REVERSE.

STEERING LEVER AT TOP CENTER OF UNIT. SWING LEVER RIGHT TO TURN RIGHT. LEFT TO TURN LEFT.

TO SET PARKING BRAKE PULL LEVER ON PLATFORM.

CHECK OIL LEVEL IN AIR CLEANER DAILY.

GREASE THROW-OUT COLLAR ON CLUTCHES DAILY. CONSULT OIL CHART FOR LUBRICATION POINTS. (WHEN USING POWER PRESSURE GREASE GUN DO NOT USE OVER 45# AIR PRESSURE.)

CHECK MANUAL FOR TORQUE CONVERTER LUBRICATION. USE GOOD GRADE OF OIL IN ENGINE (SEE LUBRICATION CHART.)

USE CLEAN SOFT WATER IN RADIATOR, REMOVE CAP WHEN DRAINING SYSTEM.

OPERATING WEIGHT
WITHOUT BALLAST
WITH BALLAST
ON DRIVE ROLL
ON GUIDE ROLL
TOTAL WEIGHT
SERIAL NO.
MODEL
HUBER CORPORATION
MARION, OHIO-USA
C
MEC 3895-272-12/1-3

Figure 1-3. Identification plates.

(5) *Clutches.*

Manufacturer	Twin Disc Company
Number	CL-210
Type	Double plate

(6) *Accessories.*

(*a*) *Engine Governor.*

Manufacturer	Synchro-Start
Type	Overspeed shutdown
Model	GSM

(*b*) *Magneto.*

Manufacturer	Fairbanks Morse
Type	FME 6B-16W

(*c*) *Generator.*

Manufacturer	Electric Autolite Company
Model	GKG 4801 ST
Voltage	24 Volts
Amperage rating	40 A (Amperes)

(*d*) *Generator Regulator.*

Manufacturer	Electric Autolite Company
Model	VBU-4001UT
Voltage rating	24 V
Current rating	40 A
Ground	Negative

(*e*) *Starter Motor.*

Manufacturer	Delco Remy Division
Model	1108272
Voltage rating	24 V

(*f*) *Carburetor.*

Manufacturer	Zenith, Carburetor Division
Model	63AW10

(*g*) *Air Cleaner.*

Manufacturer	Donaldson Company, Inc.
Model	FGA 06-0017

(*h*) *Oil Filter.*

Manufacturer	Fram
Type	Replaceable element
Model	F21P
Element number	C21P

(*i*) *Hydraulic Pump.*

Manufacturer	Hydreco Division
Model	1515C14A3DR

(*j*) *Tailshaft Governor.*

Manufacturer	Pierce Governor Company, Inc.
Model	GC-860

(*k*) *Hydraulic Oil Filter.*

Manufacturer	Gresen
Model	FA-103
Element	1553

(7) *Capacities.*

Engine cooling system	4 gallons
Fuel tank	25.5 gallons
Hydraulic system	26 quarts
Sprinkler tank	130 gallons
Engine crankcase	5 quarts
Lubrication system, W/filter.	6 quarts
Transmission case	9 quarts
Torque converter	7 1/2 quarts
Air cleaner cup	1 quart

(8) *Nut and Bolt Torque Data.* Different sizes and grades of studs, capscrews and nuts are used on the Continental engine. The following table (1-1) should be consulted when tightening such fasteners. The values given are in foot-pounds.

Table 1-1. Nut and Bolt Torque Data

Size diameter	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"
Cylinder heads	------	35–40	70–75	100–110	130–140	145–166
Main brgs. and conn. rods	20–25	35–40	70–75	85–95	100–110	------
Flywheels	20–25	35–40	70–75	85–95	100–110	145–155
Manifolds	15–20	25–30	50–55	80–90	100–110	130–140
Gear covers, water pumps, front and rear ends, oil pans	15–20	25–30	50–55	80–90	------	------
Flywheel hsgs.	15–20	25–30	50–55	80–90	115–125	------
Camshaft nut cast iron camshaft steel camshaft	65–70 120–130					
Spark plugs				35		

(9) *Adjustment Data.*

Fanbelt deflection	1/2 inch
Hydraulic pump drive belt deflection.	1/2 inch
Intake valves (cold)	.014 inch
Exhaust valves (cold)	.014 inch
Distributor contact gap	.020 inch
Spark plug gap:	
Std. Plug	.025 inch
Resistor Plug	.035 inch
Timing:	
Normal, set pointer at	"DC" or "IGN M"
At high altitudes, or low altitudes with premium gas, set to	4° BTC (Before top center) maximum
Hydraulic system pressure	500 psi.

(10) *Dimensions and Weight.*

Wheel base	121 inches
Overall length	177 inches
Overall width	60 inches
Overall height	7 feet, 3/4 inch
Ground clearance	14 inches
Rolling width	50 inches
Weight, net	12,260 pounds
Shipping cubage	582 cubic feet
Shipping weight	12,680 pounds

1-5. Differences in Models

This manual covers only the Tandem Road Roller, Model T58M, No differences exist within the serial number range covered in this manual.

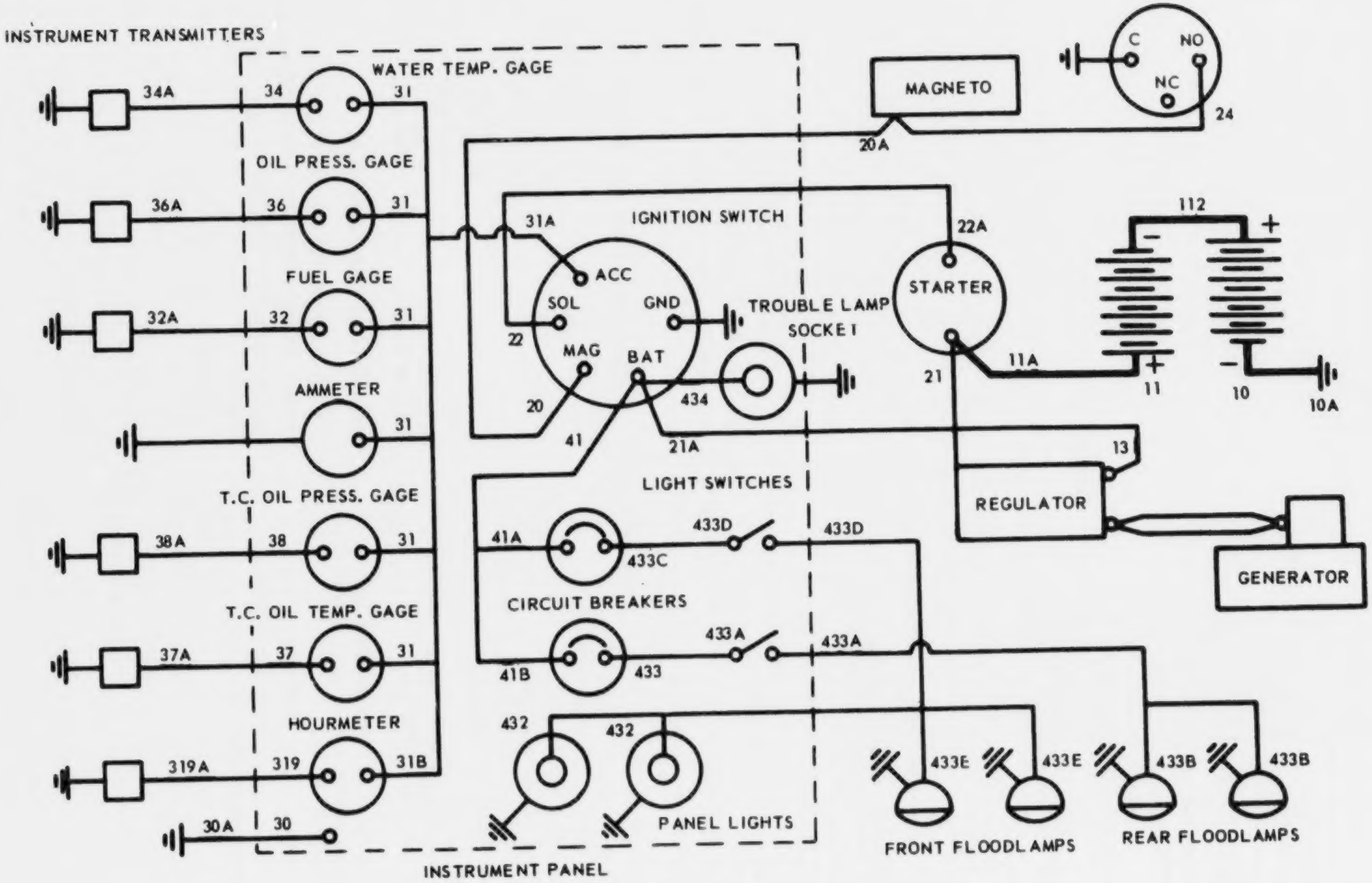

INSTRUMENT TRANSMITTERS
WATER TEMP. GAGE
34A
34
31
OIL PRESS. GAGE
36A
36
31
FUEL GAGE
32A
32
31
AMMETER
31
T.C. OIL PRESS. GAGE
38A
38
31
T.C. OIL TEMP. GAGE
37A
37
31
HOURMETER
319A
319
31B
30A
30
INSTRUMENT PANEL
31A
IGNITION SWITCH
ACC
SOL
GND
MAG
BAT
22
20
41
434
21A
TROUBLE LAMP SOCKET
LIGHT SWITCHES
41A
433C
433D
CIRCUIT BREAKERS
41B
433
433A
432
432
PANEL LIGHTS
MAGNETO
20A
C
NO
NC
24
22A
STARTER
21
11A
112
11
10
10A
13
REGULATOR
GENERATOR
433D
433A
433E
433E
433B
433B
FRONT FLOODLAMPS
REAR FLOODLAMPS

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Figure 1-4. Wiring Diagram

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

2-1. Unloading the Equipment

a. If the roller is to be removed from the flat car by a crane, attach the sling to the lifting eyes and remove from the car. Refer to Figure 2-1 for lifting points.

Warning: **Do not use a lifting device with a capacity of less than 20,000 pounds. Do not allow the unit to swing while it is suspended. Failure to observe this warning may result in serious injury or death to personnel or damage to the equipment.**

b. If the roller is to be driven off the flat car under its own power, the engine must be deprocessed and the batteries connected and activated (para 2-2 and 2-3).

c. Remove the two blocks from the drive roll which oppose the movement of the roller. Refer to figure 2-1 for blocking and tiedown points.

d. Construct a suitable ramp, if necessary. Release the parking brake (para 2-7) and slowly drive the roller off the car. Refer to fig. 2-1.

Caution: **The guide roll will not respond to the steering lever if the engine is not running.**

2-2. Unpacking Equipment

a. Remove banding and crates from the roller.

b. Open boxes carefully and remove the spare parts, fire extinguisher, cocoa mats, water hose (for sprinkler system), seat cushion, plug wrench.

c. Battery electrolyte is packed separately, and should be carefully unpacked.

Warning: **Use care in handling the containers of electrolyte as severe burns will result if acid is spilled on the skin.**

d. Remove the tape from the tool box and remove the overpack kit, ignition key, publications and control lever rubber grips from the tool box.

e. Remove the tape covering the instruments on the instrument panel.

f. Remove the tape covering electrical sockets and engine openings.

g. Remove the tape from the battery terminals and battery filler caps. Remove the battery cables that are taped to the carrier and remove the preservative from the cable connectors.

2-3. Inspecting and Servicing Equipment

a. Perform the following inspection and services upon receipt of equipment.

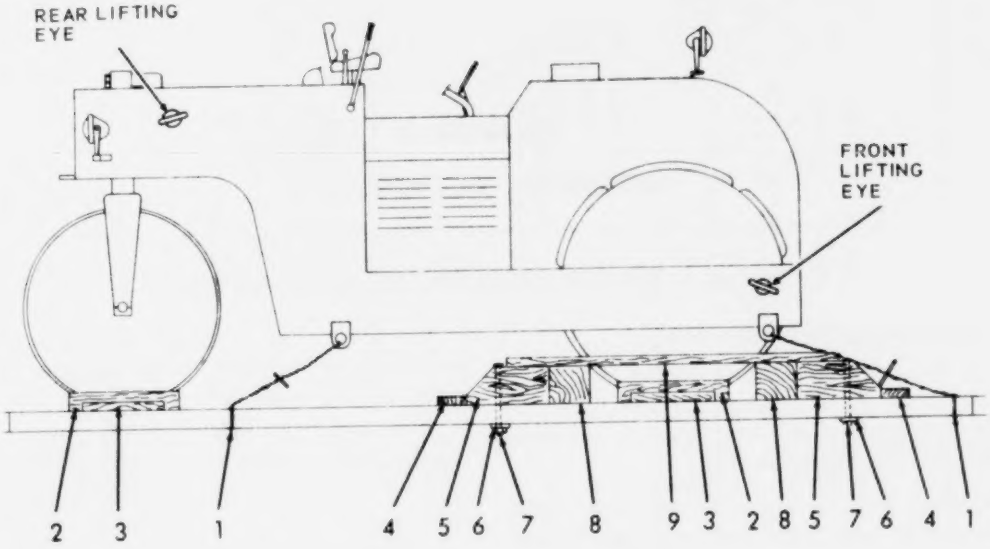
(1) Check all parts against the packing list for loss, theft, or damage.

(2) Inspect the roller for damage that may have occurred during shipping or unloading. Check for bent panels, damaged instruments and controls.

(3) Remove side covers and check the engine for evidence of leaks, damaged or disconnected lines and wires, or other defects.

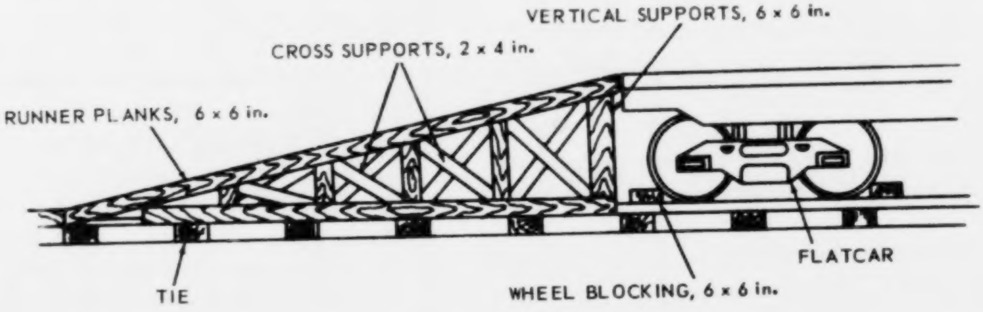
(4) Check the carburetor and governor linkage for damage and/or evidence of tampering.

(5) Check the radiator hose and fan belt for condition and adjustment (figure 3-11 for belt adjustment.)


REAR LIFTING EYE
FRONT LIFTING EYE
2
3
1
4
5
6
7
8
9
3
2
8
5
7
6
4
1

1. WIRE, 4-STRAND, 8 GA.	4 REQ'D	6. PLATE, 1/2 × 4 × 12	4 REQ'D
2. TIMBER, 4 × 4 × 23	4 REQ'D	7. BOLT, 7/8 × 13	4 REQ'D
3. TIMBER, 2 × 6 × 18	4 REQ'D	8. TIMBER, 8 × 8 × 96	2 REQ'D
4. TIMBER, 2 × 6 × 18	4 REQ'D	9. TIMBER, 2 × 6 × 72	2 REQ'D
5. TIMBER, 2 × 6 × 18	4 REQ'D		

A. BLOCKING AND TIE-DOWN POINTS.


VERTICAL SUPPORTS, 6 × 6 in.
CROSS SUPPORTS, 2 × 4 in.
RUNNER PLANKS, 6 × 6 in.
FLATCAR
TIE
WHEEL BLOCKING, 6 × 6 in.

B. UNLOADING RAMP.

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Figure 2-1. Blocking, tiedown and lifting points and unloading ramp.

(6) Locate the envelope, attached near the controls, containing the depreservation guide, DA Form 2258 (Depreservation Guide for Vehicles and Equipment). Perform the depreservation services described therein to prepare the roller for operation.

(7) Remove the battery caps and pour into each cell sufficient electrolyte to cover the plates to a depth of 3/8 inch. Install battery caps.

Warning: **Use care in handling the containers of electrolyte as severe burns will result if acid is spilled on skin.**

(8) Connect the battery cables to the batteries by reversing the instructions on figure 3-26.

(9) Clean around the filler caps on the tanks before servicing to prevent entry of any foreign matter into tanks.

(10) Fill the radiator with fresh water, using water as free of minerals as possible. Use an antifreeze mixture if below-freezing temperatures are expected.

Note. Consult antifreeze table 2-2 to prepare coolant solution.

(11) Fill fuel tank and perform lubrication service as instructed in paragraph 3-4.

Note. When adding fuel to tank before initial operation, fill tank completely full of gasoline to dilute the preservative in the tank to prevent clogging of the lines.

b. Perform Daily Preventative Maintenance Services. Refer to illustrated tabulated listing figure 3-5, in Maintenance Instructions.

c. Inspect machine for physical damage or missing parts as follows:

(1) Check for dented panels and rolls, bent control levers, broken glass in floodlights or instruments in control panel that may have occurred during shipping and/or unloading.

(2) Check sprinkler system for any missing caps, plugs, or fittings. Make sure that all hoses are securely in place, and in serviceable condition.

(3) Inspect steering, brake, and transmission linkage for bent or broken rods, tie rod ends, or clevises.

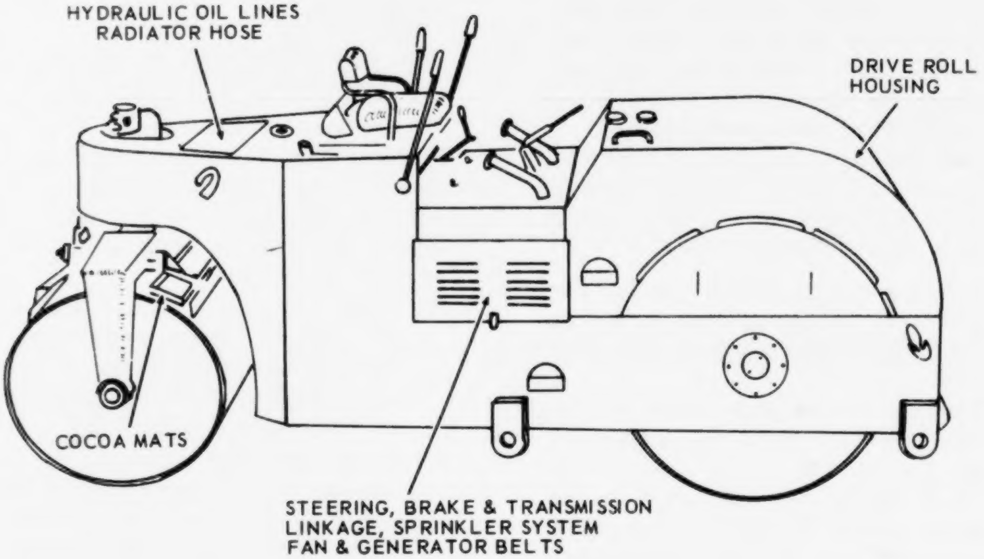
d. Test batteries with a hydrometer to determine if they are fully charged. Refer to Specific Gravity table 2-1.

Note. Consult TM9-6140-200-15 for servicing and testing batteries used in this roller.

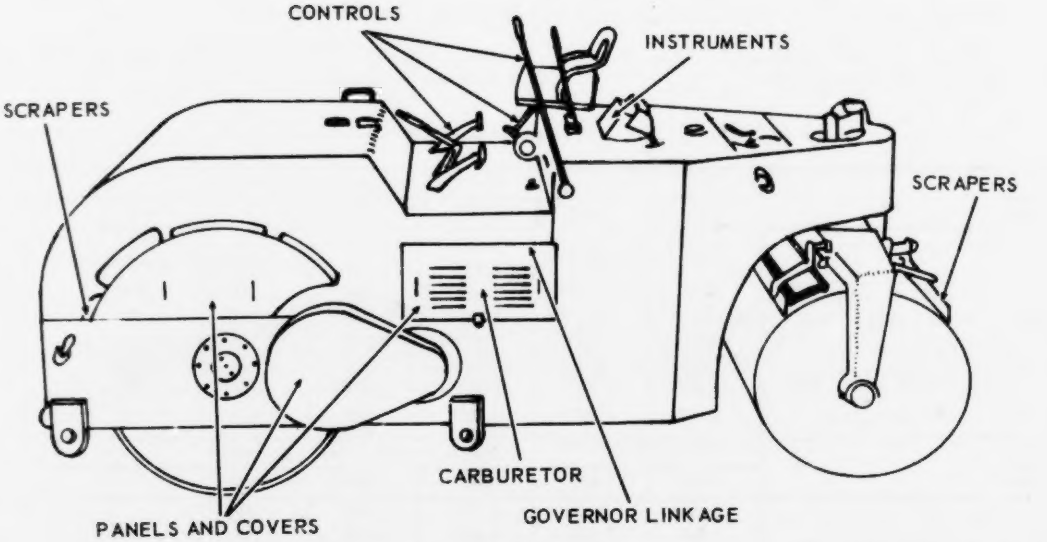
Table 2-1. Specific Gravity Readings Corrected for Temperature

Percentage of charge	Specific gravity at acid temperatures.					
	-65°F.	-40°F.	-20°F.	-10°F.	0°F.	20°F.
100%	1.338	1.328	1.320	1.316	1.312	1.304
91.6%	1.327	1.317	1.309	1.305	1.301	1.294
83.3%	1.317	1.307	1.299	1.295	1.291	1.283
75%	1.307	1.297	1.289	1.285	1.281	1.273
66.6%	1.297	1.287	1.279	1.275	1.271	1.263
58.3%	1.287	1.277	1.269	1.265	1.261	1.253
50%	1.277	1.267	1.259	1.255	1.251	1.243
25%	1.247	1.237	1.229	1.225	1.221	1.213

Percentage of charge	Specific gravity at acid temperatures.				
	40°F.	80°F.	100°F.	110°F.	120°F.
100%	1.296	1.280	1.272	1.268	1.265
91.6%	1.286	1.270	1.262	1.258	1.255
83.3%	1.276	1.260	1.252	1.248	1.245
75%	1.266	1.250	1.243	1.239	1.235
66.6%	1.256	1.240	1.233	1.229	1.225
58.3%	1.246	1.230	1.223	1.219	1.215
50%	1.236	1.220	1.213	1.209	1.205
25%	1.206	1.190	1.182	1.178	1.174


HYDRAULIC OIL LINES
RADIATOR HOSE
DRIVE ROLL HOUSING
COCOA MATS
STEERING, BRAKE & TRANSMISSION LINKAGE, SPRINKLER SYSTEM FAN & GENERATOR BELTS

A. RIGHT SIDE VIEW.


CONTROLS
INSTRUMENTS
SCRAPERS
SCRAPERS
CARBURETOR
GOVERNOR LINKAGE
PANELS AND COVERS

B. LEFT SIDE VIEW.

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Figure 2-2. Inspection points.

e. Prepare equipment for cold weather operation, if to be used in area where temperature level makes this necessary. Refer to table 2-2, Freezing Points, Composition, and Specific Gravities of Military Antifreeze Materials.

Table 2-2. Freezing Points, Composition, and Specific Gravities of Military Antifreeze Materials.

Lowest expected ambient temp 0°F.	Pints of inhibited glycol per gal of coolant [1]	Compound Antifreeze arctic [2]	Ethylene glycol coolant solution specific gravity at 68°F. [3]
+20	1 1/2	Issued full strength and ready mixed for 0° to -65°F. temperatures for both initial installation and replenishment of losses. DO NOT DILUTE WITH WATER OR ANY OTHER SUBSTANCE	1.022
+10	2		1.036
0	2 3/4		1.047
—10	3 1/4		1.055
—20	3 1/2		1.062
—30	4		1.067
—40	4 1/4		1.073
—50	Artic antifreeze preferred		
—60			
—75			

[1] Maximum protection is obtained at 60 percent by volume, that is 4.8 pints of ethylene glycol per gallon of solution.

[2] Military Specifications MIL-C-11755 Arctic type, nonvolatile compound is intended for use in the cooling system of liquid-cooled internal combustion engines for protection against freezing primarily in Arctic regions where the ambient temperature remains for extended periods of time close to -40°F. or drops below, to as low as -90°F.

[3] Use an accurate hydrometer. To test hydrometer, use 1 part ethylene glycol type antifreeze to 2 parts water. This should produce a hydrometer reading of 0°F.

Note. Fasten a tag near the radiator filler cap indicating the type of antifreeze.

2-4. Installation of Components Which are Packed in Separate Cartons

a. The electrolyte for the batteries is packed separately, and must be poured into the batteries. Refer to paragraph 2-3*d* and table 2-1.

b. Install fire extinguisher in bracket on control panel. Care should be taken safety pin is not removed or damaged when handling extinguisher.

c. Install cocoa mats on rolls. (para 3-19)

d. Install seat cushion onto seat frame (para 3-117).

e. Install sprinkler hoses for steering roll (para 3-129).

f. Install rifle case on roll hood between park brake and fuel filler.

g. Handle grips must be installed on clutch lever, gearshift lever, steering control lever and throttle control lever. These with the ignition key are packed in the tool box (para 2-2).

Section II. MOVEMENT TO NEW WORK SITE

2-5. Preparation for Movement

a. Short Move. The roller can be moved to a new site under its own power. No special preparation is needed.

b. Long Distance.

(1) The roller can be transported by a low bed semi-trailer or by railway flat car.

(2) The brakes should be set on the roller, and chocks should be placed behind the rolls to prevent rolling if brakes should not hold. Refer to figure 2-1.

Note. Be sure to drain water from sprinkling system and tank, if transporting in cold weather. Make certain that engine cooling system contains sufficient anti-freeze.

Section III. CONTROLS AND INSTRUMENTS

2-6. General

This section describes, locates, illustrates, and furnishes operator, crew, or organizational maintenance personnel sufficient information about various controls and instruments for proper operation of the tandem roller.

2-7. Controls and Instruments

The purpose of controls and instruments and their normal and maximum reading are illustrated in figure 2-3 and 2-4.

Section IV. OPERATION OF EQUIPMENT

2-8. General

a. Instructions in this section are published for information and guidance of personnel responsible for operation of the tandem road roller.

b. The operator must know how to perform any operation of which the road roller is capable. This section gives instructions on starting and stopping the roller, basic operational functions to perform specific tasks for which the equipment is designed. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

2-9. Starting the Engine

a. Preparation for Starting.

(1) Perform the Daily Preventative Maintenance Services.

(2) Carry out Inspection and Servicing procedures as outlined in Section I, paragraph 2-3*a*.

b. Starting the Engine. See figure 2-3 and start the engine, following sequential steps 1-9.

2-10. Stopping the Engine

a. Preparation for Stopping. Allow a hot engine to idle for a few minutes to permit even cooling of engine parts.

b. Stopping the Engine.

(1) Move the throttle lever (fig. 2-4) full forward.

(2) Turn ignition switch (fig. 2-3) to OFF position.

2-11. Operation under Normal Conditions

a. Preparation for Operating Roller.

(1) Perform the Daily Preventive Maintenance Services, including filling the water tank for sprinkler (para 3-6).

(2) Start the engine (para 2-9 and fig. 2-3).

b. Operating the Roller. See figure 2-4 for details.

c. Steering.

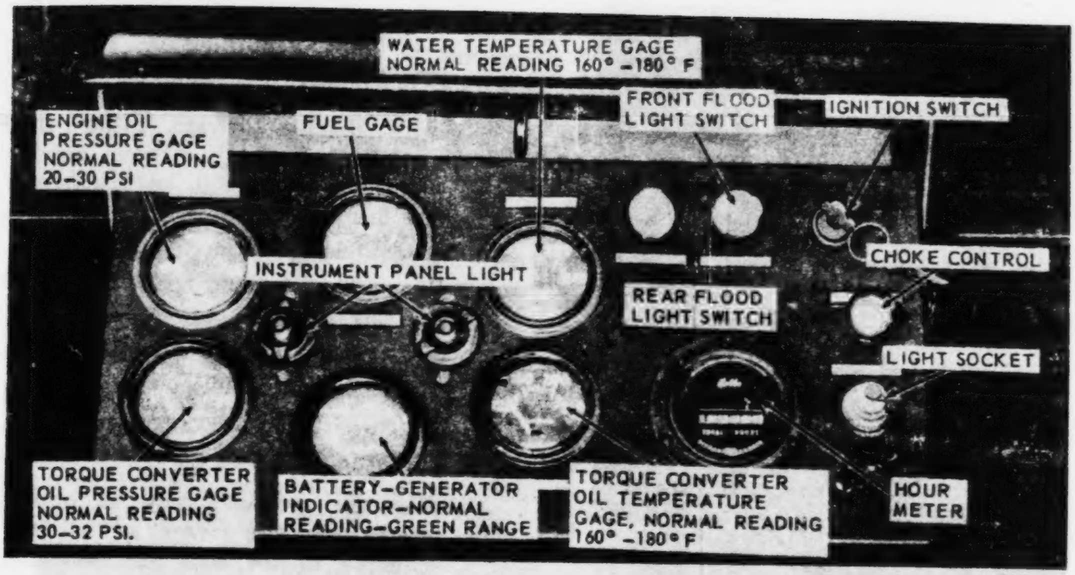
(1) Move the steering control lever to the left to steer left or to the right to steer right. When the guide roll has turned to the desired angle, return the steering control lever to center position. Otherwise, the guide roll will continue to increase steering angle as long as the lever is held off-center.

(2) When it is desired to straighten the course of motion, move the steering control lever to the opposite side to return the guide roll to straight-ahead position, then release the lever.

(3) Practice will be necessary to achieve satisfactory control of steering.

(4) Turn the variable speed steering valve counterclockwise to slow or clockwise to increase speed of steering action. Different steering action will be necessitated depending upon the type of material being rolled.

d. Turning on Loose Gravel. Drive at slow speeds when turning on loose gravel to prevent displacing the material and possibly damaging the rolls. Do not make sharp, quick turns.


WATER TEMPERATURE GAGE NORMAL READING 160° -180° F
ENGINE OIL PRESSURE GAGE NORMAL READING 20-30 PSI
FUEL GAGE
FRONT FLOOD LIGHT SWITCH
IGNITION SWITCH
INSTRUMENT PANEL LIGHT
CHOKE CONTROL
REAR FLOOD LIGHT SWITCH
LIGHT SOCKET
TORQUE CONVERTER OIL PRESSURE GAGE NORMAL READING 30-32 PSI.
BATTERY-GENERATOR INDICATOR-NORMAL READING-GREEN RANGE
TORQUE CONVERTER OIL TEMPERATURE GAGE, NORMAL READING 160° -180° F
HOUR METER

A

STEP 1. ENGAGE PARKING BRAKE.

STEP 2. CHECK THAT FORWARD & REVERSE LEVER IS IN "DISENGAGED" POSITION (MIDWAY).

STEP 3. PULL THROTTLE LEVER BACK ABOUT 1/3 OF ITS TRAVEL, TO OPEN THROTTLE.

STEP 4. PULL CHOKE CONTROL OUT ABOUT 1/3 OF ITS TRAVEL, FARTHER IN COLD WEATHER.

STEP 5. TURN IGNITION KEY TO "START" POSITION. AS SOON AS ENGINE STARTS, RELEASE KEY.

CAUTION: DO NOT OPERATE STARTER MOTOR FOR MORE THAN 30 SECONDS WITHOUT LETTING STARTER COOL FOR 2-3 MINUTES BETWEEN STARTING ATTEMPTS.

STEP 6. WHEN ENGINE STARTS, GRADUALLY PUSH CHOKE CONTROL IN AS FAST AS SMOOTH ENGINE FUNCTIONING WILL PERMIT.

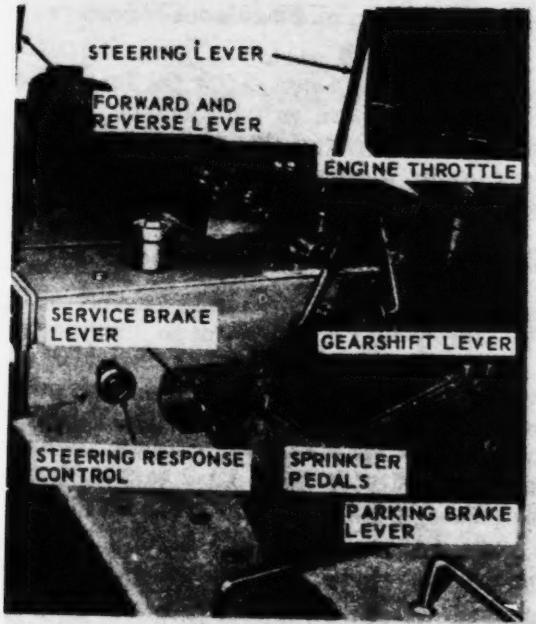
STEP 7. OBSERVE ENGINE OIL PRESSURE GAGE.

CAUTION: IF 20-30 PSI DOES NOT REGISTER ON GAGE WITHIN 8-10 SECONDS, TURN SWITCH TO "OFF" POSITION AND INVESTIGATE REASON FOR TROUBLE.

STEP 8. LET ENGINE OPERATE AT IDLING RPM FOR A FEW MINUTES, THEN INCREASE RPM TO APPROXIMATELY HALF THROTTLE UNTIL WATER TEMPERATURE GAGE SHOWS READING OF 100° F.

CAUTION: DO NOT RUN ENGINE FOR LONG PERIODS OF TIME WITHOUT MOVING THE ROLLER. OIL STARVATION IN THE TRANSMISSION WILL DAMAGE PARTS.

STEP 9. OBSERVE BATTERY-GENERATOR INDICATOR FOR A READING IN THE GREEN RANGE AT IDLING RPM. IF THE READING IS OTHERWISE, IT IS AN INDICATION OF TROUBLE IN THE ELECTRICAL SYSTEM,


STEERING LEVER
FORWARD AND REVERSE LEVER
ENGINE THROTTLE
SERVICE BRAKE LEVER
GEARSHIFT LEVER
STEERING RESPONSE CONTROL
SPRINKLER PEDALS
PARKING BRAKE LEVER

B

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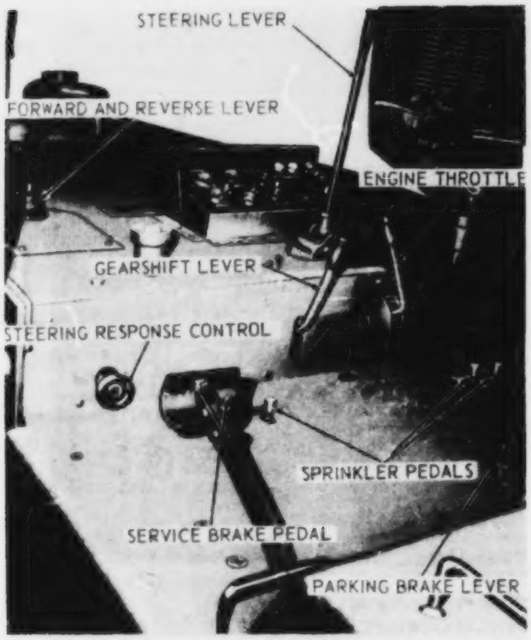
Figure 2-3. Starting the Engine



STEP 1. START ENGINE AND ALLOW IT TO REACH OPERATING TEMPERATURE.

STEP 2. MAKING SURE THE FORWARD AND REVERSE CLUTCH LEVER IS IN NEUTRAL POSITION, MOVE THE GEARSHIFT LEVER FORWARD TO HIGH OR REARWARD TO LOW RANGE AND RELEASE PARKING BRAKE.

STEP 3. PULL BACK THROTTLE CONTROL LEVER TO INCREASE ENGINE SPEED. MOVE THE FORWARD AND REVERSE CLUTCH LEVER FORWARD. BE SURE TO MOVE THE LEVER ALL THE WAY FORWARD UNTIL A DEFINITE OVER-CENTER ENGAGEMENT IS FELT.
CAUTION: DO NOT SLIP CLUTCHES BY PARTIAL ENGAGEMENT.

STEP 4. REVERSE THE ROLLER BY MOVING THE FORWARD AND REVERSE CLUTCH LEVER TO THE REAR, FULLY ENGAGING THE CLUTCH.
NOTE: ROLLER MOTIONS CAN BE SAFELY REVERSED AT SLOW OR MODERATE SPEEDS WITHOUT SLOWING DOWN BY MOVING THE REVERSE CLUTCH LEVER DIRECTLY TO THE OPPOSITE POSITION. HOWEVER, THIS PRACTICE CANNOT BE FOLLOWED WHEN ROLLING FINISHED SURFACES.

STEP 5. STOP THE ROLLER BY MOVING THE FORWARD AND REVERSE CLUTCH LEVER TO NEUTRAL POSITION, DEPRESSING THE BRAKE PEDAL AS NEEDED AND MOVING THE THROTTLE CONTROL LEVER FORWARD TO IDLE THE ENGINE.

STEP 6. TO SHIFT GEARS, BRING THE ROLLER TO A COMPLETE STOP. WITH THE FORWARD AND REVERSE CLUTCH LEVER IN NEUTRAL POSITION, MOVE THE GEARSHIFT LEVER TO THE DESIRED RANGE.
CAUTION: DO NOT ATTEMPT TO SHIFT GEARS WITH THE FORWARD AND REVERSE CLUTCH LEVER ENGAGED OR THE ROLLER IN MOTION.

STEP 7. STEER ROLLER OVER DESIRED COURSE. REF. PAR. 2-11 c.

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Figure 2-4. Operating the Roller.

e. Turning on Pliable Material.

(1) If at all possible, do not turn roller on pliable finish material. Make maneuvers off the end of the strip. If turns must be made, make turns while driving forward rather than backward. This will prevent digging in of the guide roll, particularly of the leading edge of roll, in regard to direction of travel.

(2) Use a slow turning speed by adjusting the variable speed steering valve.

(3) Avoid sudden stops or starts while operating on pliable surfaces. Refer to paragraphs 2-12, 2-13.

f. Using Sprinkler.

(1) Use the sprinkler only on bituminous surfaces to prevent asphalt from clinging to the rolls and damaging the surfaces being rolled.

(2) Depress the right sprinkler control pedal to wet the drive roll, and the left pedal to wet the guide roll.

2-12. Operating on Bituminous-Macadam Pavements

a. Foundation Course. After the foundation course is evenly laid on the subgrade, roll the course beginning from the sides and gradually work toward the center. Move the roller parallel to the centerline of the road. When rolling a banked curve, roll from the inner to the outer or high edge. The passes should overlap the previous path by about one foot (12 inches) to avoid a ridge.

b. Wearing Course. This course will be rolled in the same manner as for the foundation course. Roll the course until no improvement is seen from further operation. Rolling speeds should be between 1 1/2 to 3 miles per hour.

c. Key or Filler Stone. When the key or filler stone has been evenly spread over the bitumen, roll the stone as above until a tight, compact surface is obtained.

d. Cover Stone. Roll the cover stone in the same manner as the key or filler stone.

2-13. Operating on Bituminous-Concrete and Sheet-Asphalt Pavements

a. General. In general, rolling of surfaces should be continued until no further improvement is noted in succeeding passes. This will be done in less time than when rolling macadam pavements because the bituminous concrete and sheet-asphalt materials set up quicker. Rolling speeds will be slow, generally between one and one-half and three miles per hour. During the rolling operation, the surfaces must be tested for density and trueness and corrections made at once.

b. Binder Course. After the binder course has been evenly distributed and is of uniform density, begin the rolling operation while the course is still hot. Start at the sides and proceed toward the center, overlapping each pass about one foot to avoid a ridge. After this first pattern is finished, roll the surface diagonally in two directions. Use the sprinklers during this operation to prevent asphalt from sticking to the rolls.

c. Wearing Course. Roll the wearing course in the same manner described for the binder course.

2-14. Handling on Paving Jobs

General rules applicable to all rolling operation are as follows:

a. On soft, pliable materials roll at a slow rolling speed, generally between one and one-half to three miles per hour.

b. When starting, stopping, and reversing directions of travel on asphaltic surfaces, avoid sudden changes in speed. Otherwise, material will be shoved out of place or marred. Do not stop or change direction in the same spot each time.

c. Make turns at the ends of the runs whenever possible to avoid marring the rolled surface. (Refer to para 2-11.)

d. Do not leave the roller standing on new or setting pavement surfaces. Depressions will form in the pavement due to weight of the roller.

e. Do not use the sprinkling system when rolling subgrades as dirt and fine gravel will adhere to the rolls, spoiling the surface. If water is to be used for compaction, a sprinkler wagon should be used in advance with time allowed for the surface to dry a bit before rolling.

f. Keep the scrapers adjusted and cleaned out. An excess of material behind the scrapers can fall and mar the surface. Trapped, hard stone can hasten wear of scrapers and rolls and very hard stone can groove rolls.

g. Extra skill and care are needed when the pavement has obstructions, such as manholes. Care should be taken when approaching an obstruction that the clutch be disengaged in time to prevent the rolls from striking or climbing over the obstruction. Straight passes should be made first as normal as possible, followed by curved passes later.

h. Do not allow the roller to drop oil or grease as this will affect asphaltic material, retarding or preventing setting.

2-15. Operation in Extreme Cold

a. General. Low temperatures require special care and additional maintenance to prevent damage to equipment and to insure unfailing operation.

b. Lubrication. Be sure winter grades of lubricants are used. Allow longer time for warming up the engine to insure adequate lubrication reaching vital working parts. Engage clutch slowly when first moving the roller to prevent shock to gears and shafts due to the stiffness of the heavy transmission lubricant.

c. Fuel System. Keep the fuel tank filled as much of the time as possible, and always fill the tank at the end of the working day to prevent moisture condensing in the tank. Remove any water that appears in the fuel sediment bowl. Use care when handling fuel to prevent entrance of ice and snow.

d. Water Supply. Drain the sprinkler tank as soon as the day's work is over to prevent freeze up. Do not fill sprinkler tank at the start of a day's work until the engine has been started and some heat reaches the tank. Be sure the radiator is adequately protected with antifreeze.

e. Electrical System. The insulation on wiring becomes stiff in subzero weather. Move wiring as little as possible to avoid damage. Never add water to batteries unless the engine is to be run for several hours immediately afterward. The water unmixed with electrolyte may freeze and break battery cases.

f. Drive and Guide Rolls. The Huber T58M Roller was furnished as a fixed weight roller. However, in the event ballast is added to the rolls, water should be drained from the rolls when freezing temperatures are expected. If for some reason ballast is used when freezing temperatures prevail, fuel oil, kerosene, or other liquids with very low freezing points can be used in place of water.

2-16. Operation in Extreme Heat

a. General. Extra care must be taken when operating in extreme heat conditions to prevent overheating of equipment.

b. Lubrication. Be sure to use the proper grade of lubricants for high temperatures. Check the engine crankcase oil level more frequently and keep level to full mark on dipstick.

c. Cooling System. Check the coolant level more frequently. Remove any accumulation of trash from the radiator, and keep the fins cleaned out by using compressed air or water from a hose. Inspect and adjust the fan belt more frequently.

d. Electrical System. Check the batteries more frequently for loss of water due to evaporation. Excessive loss of water may indicate too high a charging rate caused by a defective generator regulator.

2-17. Dusty or Sandy Areas

a. General. Dust and sand penetrate vital parts unless special care is taken to prevent it. Equipment wears out more quickly in dusty, sandy areas than under any other environmental condition.

b. Lubrication. Wipe off lubrication fittings before applying grease gun. Wipe off lubricant after servicing. Lubricate sparingly but more often. Clean around filler openings before removing caps or covers for lubrication. After removal from sandy environment, the gear covers should be removed, the drive gears thoroughly cleaned and relubricated. Service air cleaner, oil filter, and breathers more frequently. Keep lubricants and lubricating equipment covered tightly and clean to keep out abrasive foreign matter. Keep equipment in an inclosure when not in use, or protect from wind by covering with a tarpaulin or the best protection feasible.

c. Fuel System. Keep the fuel containers clean and tightly covered. Check fuel sediment bowl more often for deposits of sand and dust.

2-18. Salt Water or High Humidity Areas

a. General. Salt water causes rapid corrosion. Keep equipment well painted and clean. Wash in clean water frequently, if available. Keep equipment covered to minimize collecting moisture.

b. Fuel System. Fill fuel tank at end of day's operation to minimize condensation. Check fuel sediment bowl more often for water.

c. Electrical System. Salt water and high humidity cause corrosion and poor connections in electrical components. Use care to prevent damage to the fungus proofing of the electrical components. Remove corrosion from electrical connections when evident.

2-19. Operation in High Altitude

a. General. As altitude increases, the density of air decreases with resultant decrease in oxygen for combustion and decrease in horsepower.

b. Fuel System. Clean and service the air cleaner more often to be sure that the maximum supply of air is available at the intake manifold.

c. Electrical System. At higher altitudes there is less tendency for spark knock. The magneto may be advanced to a maximum of 4° over normal setting for some improvement in engine performance (para 3-65).

Section V. OPERATION OF AUXILIARY MATERIAL USED IN CONJUNCTION WITH THE ROLLER

2-20. Fire Extinguisher

a. Description. The fire extinguisher is the dry chemical type charged with inert gas under pressure. It is useful for all classes of fires and is safe to use on electrical fires. The chemical is non-toxic to humans and when used on a fire, emits no toxic by-product.

b. Operation.

(1) Open clamp securing fire extinguisher in bracket.

(2) Remove extinguisher from bracket and pull out safety pin, breaking the wire seal.

(3) Aim extinguisher nozzle at base of flames and squeeze the grip.

(4) For general fires or burning liquids, discharge chemical at base of flame with a sweeping motion while advancing.

(5) For electrical fires, turn off current if possible. Aim stream directly into burning part.

c. Maintenance.

(1) Observe pressure gauge; if hand is in white area, extinguisher is ready for service and needs no further checking. This inspection should be made every 30 days, at least.

(2) If gauge hand is to the left of white area, pull safety pin, invert extinguisher and squeeze handle until pressure hand is down to zero on gauge. Unscrew valve assembly and remove from cylinder.

(3) Refill cylinder as necessary with dry chemical powder until complete extinguisher including valve assembly, weighs amount listed on name plate of cylinder, usually 4 3/4 pounds.

(4) Remove nozzle from valve assembly, apply air pressure or nitrogen pressure to valve through opening, holding down on handle, to remove any powder remaining in valve.

(5) Replace valve in cylinder, after placing a small amount of light oil to O ring on threaded area. Tighten hand tight only.

(6) Use air or nitrogen to charge extinguisher. Attach a suitable moisture trap with proper threaded connection to the valve nozzle seat. Squeeze extinguisher handle and apply air or nitrogen till gauge indicates 150 psi. Release handle and disconnect trap from valve. Reinstall nozzle.

(7) Insert safety key in handle, seal with wire and lead seal.

(8) Attach tag stating data and name of person recharging extinguisher.

2-21. Trouble Light

a. Description. The trouble light is a 25-foot extension light which is stored in the tool box.

b. Operation. Remove the cap from the receptacle on the instrument panel. Insert the plug to the bottom, twist clockwise to lock the connection.

c. Maintenance. Replace burned out lamp by pushing lamp to bottom of socket, twist and extract the lamp.

CHAPTER 3

OPERATOR AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. OPERATOR AND ORGANIZATIONAL MAINTENANCE TOOLS AND EQUIPMENT

3-1. Special Tools and Equipment

No special tools or equipment are required by operator or organizational personnel for maintenance of the tandem road roller.

3-2. Basic Tools and Equipment

Tools and repair parts issued with or authorized for use with the tandem road roller are listed in the Basic Issue Items List.

Section II. LUBRICATION

3-3. General Lubrication Information

a. This section contains a reproduction of the lubrication order and lubrication instructions which are supplemental to, and not specifically covered in the lubrication order.

b. The lubrication order shown in figure 3-1 is an exact reproduction of the approved lubrication order for the tandem roller. For the current lubrication order, refer to DA-PAM-310-4 (Military Publications).

3-4. Detailed Lubrication Information

a. Care of Lubricants. Store all lubricants in covered containers and keep in protected place. Clean all containers before they are opened to prevent entry of dirt. Clean lubricating equipment before and after use.

b. Cleaning. Clean around all lubrication fittings, oil covers, filler caps, and breathers before lubricating. Clean all lubrication points after lubricating to prevent accumulation of foreign matter.

c. Points of Lubrication.

(1) The points of lubrication will be covered in the lubrication chart, figure 3-1. Follow the instructions and use the specified lubricants.

(2) Apply pressure lubricant until clean lubricant oozes from the part being lubricated.

(3) Do not overfill crankcase or sumps as it is not only wasteful but can be harmful to the equipment.

d. Special Lubrication Instructions.

(1) The service intervals are based on hours of normal operation. Shorten intervals to compensate for abnormal operations and severe conditions. During inactive periods, intervals may be lengthened to the point where lubricant protection is assured.

(2) Drain oil sumps when equipment is hot after operation.

(3) For information on changing grades of lubricants, refer to Key in lubrication chart.

e. OES Oil.

(1) The crankcase oil level must be checked frequently, as oil consumption may increase.

(2) The oil may require changing more frequently than usual because contamination by dilution and sludge

formation will increase under cold weather operation conditions.

f. Oil Filter Service. Service the oil filter as instructed on figure 3-2.

g. Air Cleaner Service. Service the air cleaner as instructed on figure 3-3.

h. Transmission Breather Service. Service the transmission breather as instructed on figure 3-4.

i. Torque Converter Sump Breather Service. Service the torque converter sump breather as instructed on figure 3-4.

LUBRICATION CHART

ROLLER, MOTORIZED, 5 TO 8 TON TANDEM, GED
(HUBER CORP. MODEL T 58 M)

Reference: TM 5-3895-272-12 and TM 5-3895-272-35

Intervals are based on normal hours of operation. Reduce intervals to compensate for abnormal operations and severe conditions. During inactive periods, sufficient lubrication must be provided for adequate preservation.

Clean fittings before lubricating.

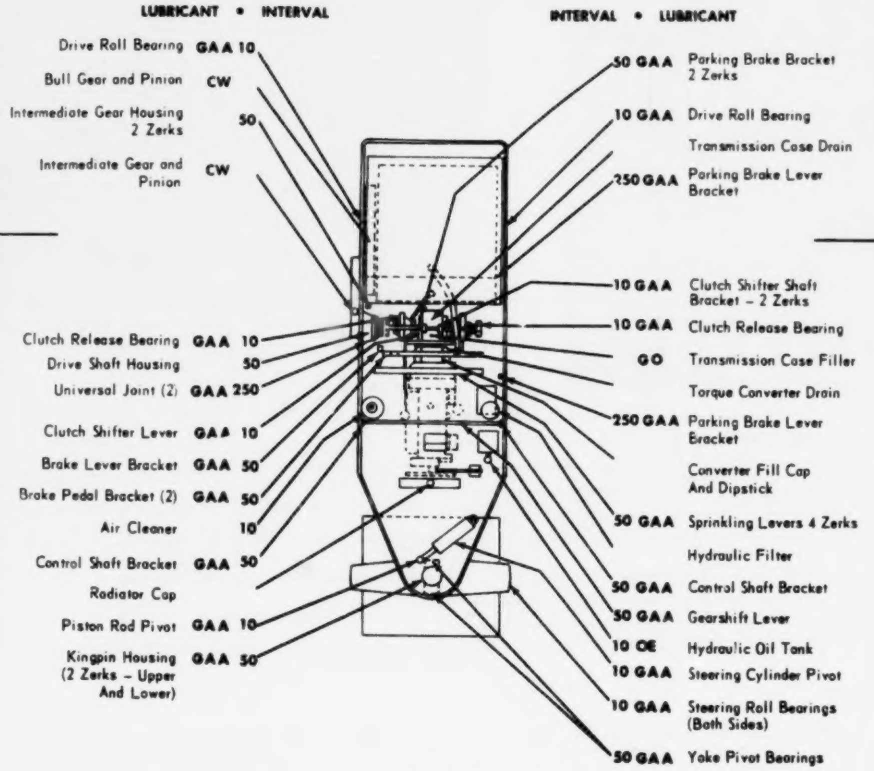
Relubricate after washing or fording.

A dotted circle indicates a drain below.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, diesel. Dry before lubricating.

Lubricate points indicated by dotted arrow shafts on both sides of equipment.

Drain crankcase and gearcases when hot. Fill and check level.


LUBRICANT • INTERVAL
Drive Roll Bearing GAA 10
Bull Gear and Pinion CW
Intermediate Gear Housing 2 Zerks 50
Intermediate Gear and Pinion CW
Clutch Release Bearing GAA 10
Drive Shaft Housing 50
Universal Joint (2) GAA 250
Clutch Shifter Lever GAA 10
Brake Lever Bracket GAA 50
Brake Pedal Bracket (2) GAA 50
Air Cleaner 10
Control Shaft Bracket GAA 50
Radiator Cap
Piston Rod Pivot GAA 10
Kingpin Housing (2 Zerks – Upper And Lower) GAA 50
INTERVAL • LUBRICANT
50 GAA Parking Brake Bracket 2 Zerks
10 GAA Drive Roll Bearing
Transmission Case Drain
250 GAA Parking Brake Lever Bracket
10 GAA Clutch Shifter Shaft Bracket – 2 Zerks
10 GAA Clutch Release Bearing
GO Transmission Case Filler
Torque Converter Drain
250 GAA Parking Brake Lever Bracket
Converter Fill Cap And Dipstick
50 GAA Sprinkling Levers 4 Zerks
Hydraulic Filter
50 GAA Control Shaft Bracket
50 GAA Gearshift Lever
10 OE Hydraulic Oil Tank
10 GAA Steering Cylinder Pivot
10 GAA Steering Roll Bearings (Both Sides)
50 GAA Yoke Pivot Bearings

CONTINUED ON
FOLLOWING PAGE

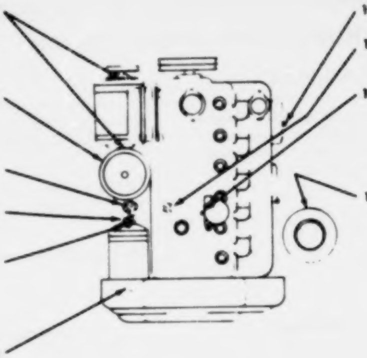
MEC 3895-272-12/3-1①

Figure 3-1. Lubrication order.

CONTINUED FROM
PRECEDING PAGE

LUBRICANT • INTERVAL

INTERVAL • LUBRICANT



Generator Bearings **1000**
Sealed bearings, serviced by 3rd Echelon at time of disassembly

Oil Filter **OE 100**
Replace elements at crank case oil change. See note 3

Crankcase Fill Plug **OE**
Fill to level. See key

Crankcase Level Stick **10**
Check Level

Starter Commutator End Bearing **OE**
Serviced by 3rd Echelon at time of disassembly

Starter Drive End Bearing **OE 500**
Remove to lubricate

1000 OE Magneto Wick

100 Crankcase Drain Plug
Drain and refill

100 OE Overspeed Governor
Lubricate sparingly

10 OE Air Cleaner
See Key. Daily refill oil cup, weekly clean screen and cup. Fill cup with OE to level mark and reinstall

– KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Ab[illegible]	[illegible] 10 F	0 F to 65 F	
OE OIL, Engine, Heavy Duty		OE 30 or 9250	OE 10 or 9110	OES	Intervals given are normal hours of operation
Crankcase	5 qt				
Oil Filter	See Note 3				
Air Cleaner	1 qt				
OES OIL, Engine, Subzero					
GO LUBRICANT, Gear Universal		GO 90	GO 90	GOS	
Transmission	9 qts				
GOS LUBRICANT, Gear Universal Subzero					
CW OIL, Lubricating, Exposed gear Main Gear and Pinion		CW11B FED-VV-L-751	CW11B	CW11A FED-VV-L-751	
OE 10 Hydraulic Oil Tank	26 qts	All Temperatures			
Torque Converter	9 1/2 qts				
GAA GREASE, Automotive and Artillery					

NOTES.

1 FOR OPERATING OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW –10°F. Remove the lubricants prescribed in the key for above 10°F. Clean parts with SOLVENT, dry-cleaning, and drain gear case. Relubricate with lubricants indicated in the key for below –10°F temperatures.

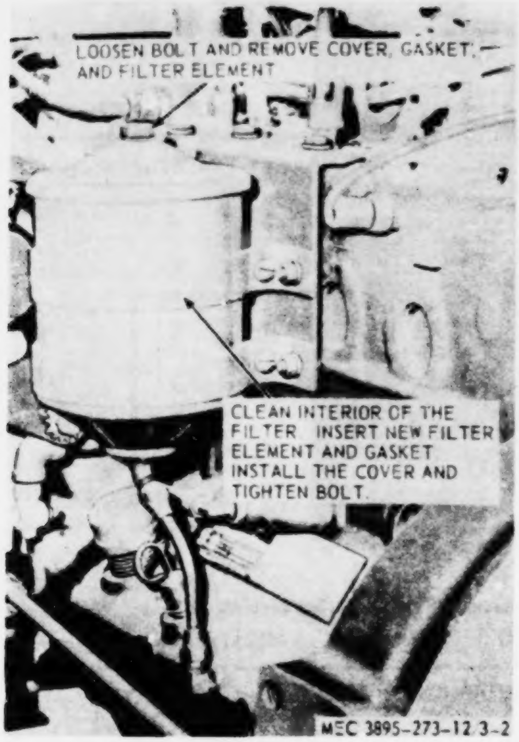
2 TORQUE CONVERTOR. Weekly check level with dipstick with engine STOPPED. Fill to level as required.

3 OIL FILTER. When changing filter elements, fill crankcase, operate engine 5 minutes, check filter and lines for leaks, check crankcase oil level, bring to full mark.

4 OIL CAN POINTS. Weekly lubricate yoke pins, ball and socket joints and control linkage with OE.

MEC 3895-272-12 3-1 ②

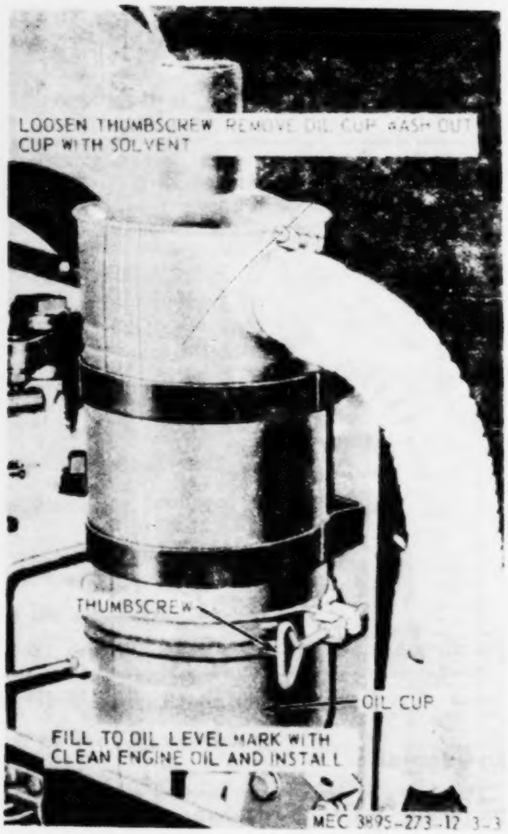
Figure 3-1—Continued.


LOOSEN BOLT AND REMOVE COVER, GASKET, AND FILTER ELEMENT

CLEAN INTERIOR OF THE FILTER. INSERT NEW FILTER ELEMENT AND GASKET. INSTALL THE COVER AND TIGHTEN BOLT.

MEC 3895-273-12/3-2

Figure 3-2. Oil Filter Service.


LOOSEN THUMBSCREW. REMOVE OIL CUP. WASH OUT CUP WITH SOLVENT

FILL TO OIL LEVEL MARK WITH CLEAN ENGINE OIL AND INSTALL

MEC 3895-273-12 3-3

Figure 3-3. Air cleaner service.

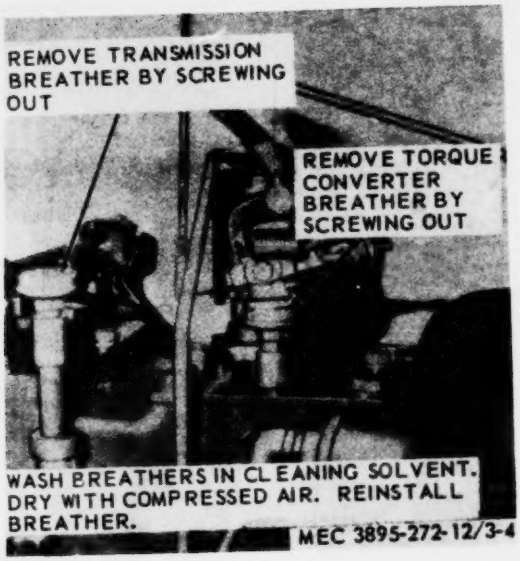

REMOVE TRANSMISSION BREATHER BY SCREWING OUT
REMOVE TORQUE CONVERTER BREATHER BY SCREWING OUT
WASH BREATHERS IN CLEANING SOLVENT. DRY WITH COMPRESSED AIR. REINSTALL BREATHER.
MEC 3895-272-12/3-4

Figure 3-4. Transmission and Torque Converter Sump breather service.

Section III. PREVENTIVE MAINTENANCE SERVICES

3-5. General

To insure that the tandem roller is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary Preventive Maintenance Services to be performed are listed and described in paragraphs 3-6 and 3-7. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the unit shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation, which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded together with the corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

3-6. Daily Preventive Maintenance Services

This paragraph contains an illustrated tabulated listing of Preventive Maintenance Services which must be performed by the operator. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 3-5 for the Daily Preventive Maintenance Services.

3-7. Quarterly Preventive Maintenance Services

a. This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by Organizational Maintenance personnel at quarterly intervals. A quarterly interval is equal to three (3) calendar months, or 250 hours of operation, whichever occurs first.

b. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 3-6 for the Quarterly Preventive Maintenance Services.

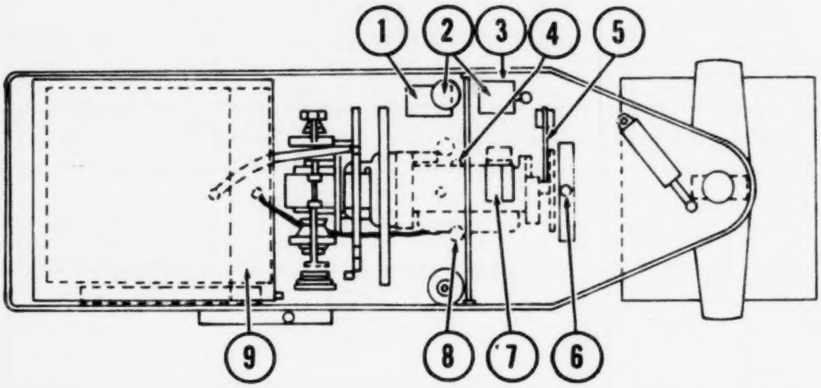
PREVENTIVE MAINTENANCE SERVICES

DAILY

TM 5-3895-272-12

HUBER CORPORATION
MODEL T58M

ROLLER, ROAD



ITEM	LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER	PAR REF
1	BATTERIES. Check electrolyte level. Fill to 3/8 inch above the plates. Check cables by hand for secure connections. In freezing weather run the engine at least one hour after adding water. (Weekly)	2-3 3-60
2	HYDRAULIC TANK AND FILTER. Check fluid level in tank. Service hydraulic filter.	3-17
3	FIRE EXTINGUISHER. Inspect for broken seal.	2-20
4	OIL LEVEL GAGE. Check engine oil level. Add oil to proper level.	3-3
5	FAN AND HYDRAULIC PUMP BELTS. Check tension. Correct tension is 1/2 inch deflection midway between pulleys. (Weekly)	3-13 3-17
6	COOLING SYSTEM. Check coolant level. Correct level is just below overflow.	3-12

MEC 3895-272-12/3-5 ①

Figure 3-5. Daily preventive maintenance services.

ITEM		PAR REF
7	CONTROLS AND INSTRUMENTS. Inspect for damage and loose mounting. With unit running, check for proper operation. Normal instrument readings are as follows: Oil Pressure — 20 to 30 psi Temperature — 160° to 180°F. Ammeter — In green range Converter Oil Pressure — 30 to 32 psi	2-9
8	FUEL SEDIMENT BOWL. Remove and clean bowl. (Weekly)	3-10
9	FUEL TANK. Check fuel level.	3-11
	NOTE: OPERATION. During operation observe for any unusual noise or vibration.	
	MEC 3895-272-12/3-5 ②	

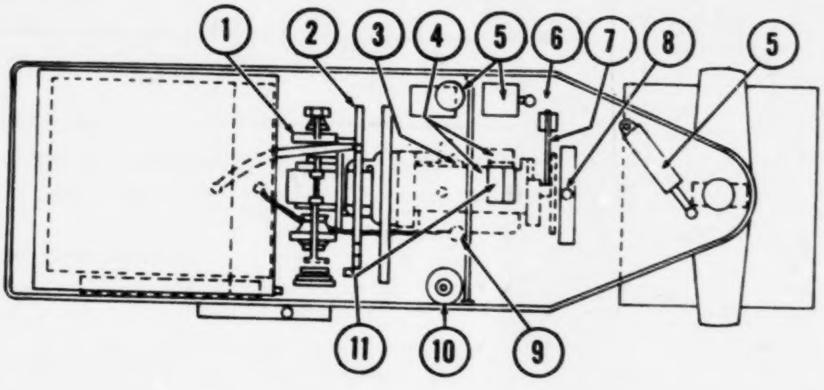
Figure 3-5—Continued.

PREVENTIVE MAINTENANCE SERVICES
QUARTERLY

TM 5-3895-272-12

HUBER CORPORATION
MODEL T58M

ROLLER, ROAD



ITEM	LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER	PAR REF
1	FORWARD AND REVERSE – CLUTCHES. Inspect for wear and proper adjustment. Clutches engage with a definite snap when properly adjusted.	3–14
2	SPRINKLER SYSTEM. Inspect for leaks and proper operation.	3–18
3	ENGINE OIL LEVEL. Check oil level. Add or change oil in accordance with current lubrication order.	3–3
4	ELECTRICAL SYSTEM. Inspect magneto points for wear, pitting, and adjustment (0.015) in.). Check spark plugs for proper operation and adjustment (0.025 in.) (500 hours). Check generator brushes. Replace if worn to less than 1/2 in. in length. Check battery electrolyte. Fill to 3/8 in. above the plates. Check for loose connections and damaged wiring. Replace damaged wiring and tighten loose connections.	3–65 3–66 3–62 3–60 3–70
5	HYDRAULIC SYSTEM. Inspect for leaks and damage. Check hydraulic fluid level. Replace leaking lines and tighten connections.	3–17
6	FIRE EXTINGUISHER. Inspect for broken seal. Check for full charge by weighing.	2–20
7	BELTS. Inspect for wear, fraying, cuts, and proper adjustment. Proper adjustment is 1/2 in. deflection midway between pulleys.	3–13 3–17

MEC 3895-272-12/3-6 ①

Figure 3-6. Quarterly preventive maintenance services.

ITEM		PAR REF
8	COOLING SYSTEM. Inspect for leaks and damage. Clean the aid passages in the radiator core and check coolant level.	3-75
9	FUEL SYSTEM. Inspect for leaks and damage. Clean fuel strainer and sediment bowl.	3-10
10	AIR CLEANER. Remove and clean oil cup. Fill in accordance with current lubrication order.	3-53
11	CONTROLS AND INSTRUMENTS. Replace damaged instruments. Tighten loose mounting. With unit operating, check controls for proper operation. Normal instrument readings are: Oil pressure 20 to 30 psi Temperature 160° to 180° F. Ammeter In green range Converter oil pressure 30 to 32 psi	3-87 to 3-108
	NOTE 1. OPERATIONAL TEST. During operation observe for any unusual noise or vibration. NOTE 2. ADJUSTMENTS. Make all necessary adjustments during operational test.	See adjustments in index

MEC 3895-272-12 3-6 ②

Figure 3-6—Continued.

Section IV. OPERATOR'S MAINTENANCE

3-8. General

The instructions in this section are published for the information and guidance of the operator to maintain the roller.

3-9. Carburetor

Adjust the carburetor as instructed on figure 3-7.

3-10. Fuel Pump

Service the fuel pump as instructed on figure 3-8.

3-11. Fuel Tank Services

a. Service the fuel tank as instructed on figure 3-9.

b. Flush the tank with an approved cleaning solvent.

c. Fill the fuel tank.

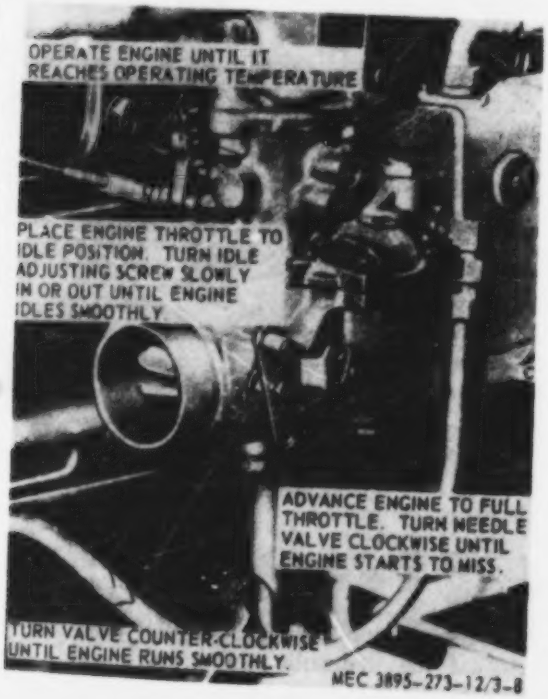

OPERATE ENGINE UNTIL IT REACHES OPERATING TEMPERATURE
PLACE ENGINE THROTTLE TO IDLE POSITION. TURN IDLE ADJUSTING SCREW SLOWLY IN OR OUT UNTIL ENGINE IDLES SMOOTHLY.
ADVANCE ENGINE TO FULL THROTTLE. TURN NEEDLE VALVE CLOCKWISE UNTIL ENGINE STARTS TO MISS.
TURN VALVE COUNTER-CLOCKWISE UNTIL ENGINE RUNS SMOOTHLY.
MEC 3895-273-12/3-8

Figure 3-7. Carburetor adjustment.

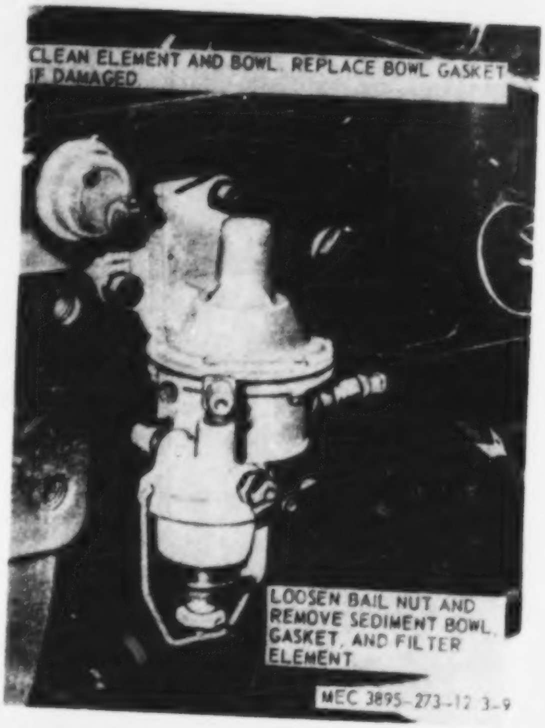

CLEAN ELEMENT AND BOWL. REPLACE BOWL GASKET IF DAMAGED.
LOOSEN BAIL NUT AND REMOVE SEDIMENT BOWL, GASKET, AND FILTER ELEMENT.
MEC 3895-273-12 3-9

Figure 3-8. Fuel pump service.

3-12. Cooling System Service

Service the cooling system as instructed on figure 3-10.

3-13. Fan Belt

Adjust the fan belt as instructed on figure 3-11.

3-14. Forward and Reverse Clutches

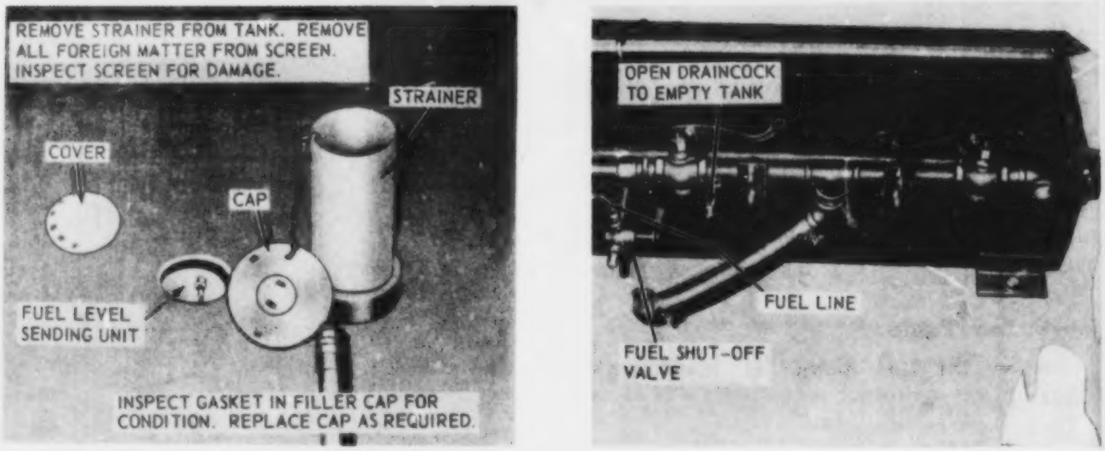
Adjust the forward and reverse clutches as instructed on figure 3-12.

3-15. Service Brake

Adjust the service brake as instructed on figure 3-12.

3-16. Parking Brake

Adjust the parking brake as instructed on figure 3-13.

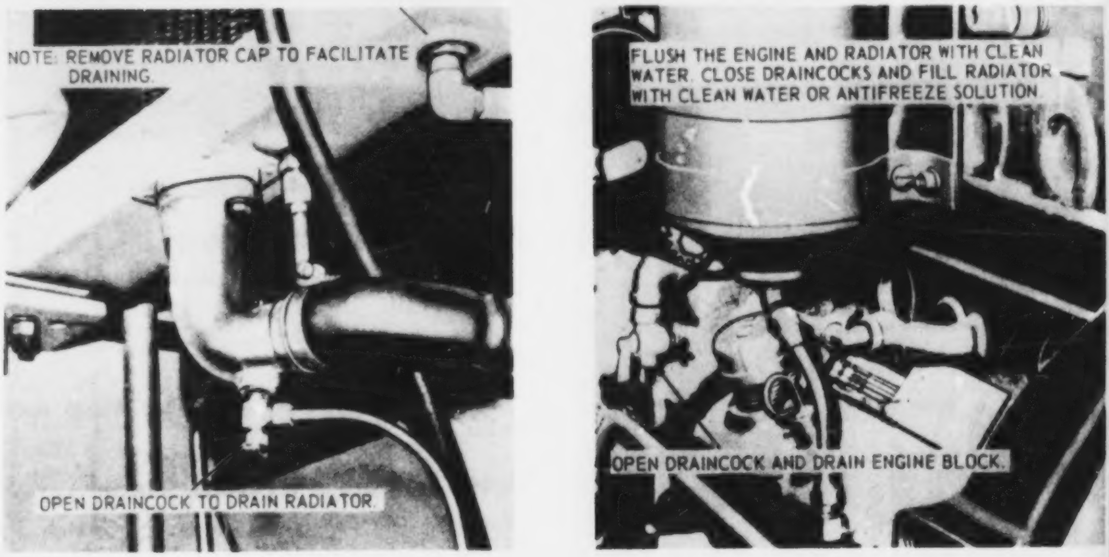

REMOVE STRAINER FROM TANK. REMOVE ALL FOREIGN MATTER FROM SCREEN. INSPECT SCREEN FOR DAMAGE.
STRAINER
COVER
CAP
FUEL LEVEL SENDING UNIT
INSPECT GASKET IN FILLER CAP FOR CONDITION. REPLACE CAP AS REQUIRED.
OPEN DRAINCOCK TO EMPTY TANK
FUEL LINE
FUEL SHUT-OFF VALVE

A. FUEL TANK FILLER CAP AND STRAINER.

B. FUEL TANK SHUT-OFF VALVE AND DRAINCOCK.

MEC 3895-272-12 3-

Figure 3-9. Fuel tank service.


NOTE: REMOVE RADIATOR CAP TO FACILITATE DRAINING.
OPEN DRAINCOCK TO DRAIN RADIATOR.
FLUSH THE ENGINE AND RADIATOR WITH CLEAN WATER. CLOSE DRAINCOCKS AND FILL RADIATOR WITH CLEAN WATER OR ANTIFREEZE SOLUTION.
OPEN DRAINCOCK AND DRAIN ENGINE BLOCK.

A. RADIATOR DRAIN

B. BLOCK DRAIN

MEC 3895-273-12 3-11

Figure 3-10. Cooling system service.

3-17. Hydraulic System Service

a. Hydraulic Tank Service. Service the hydraulic tank as instructed in figure 3-14, A, B.

b. Hydraulic Pump Drive Belt Adjustment. Adjust the hydraulic pump drive belt as instructed in figure 3-14, C.

c. Hydraulic Filter Service. Service the hydraulic filter as necessary as instructed in figure 3–14, D.

3–18. Sprinkler System

Adjust the sprinkler system as instructed on figure 3–15.

3–19. Mats

Replace the cocoa mats as instructed on figure 3–16.

Note. When sprinkler system is not being used, hang up the mats to prevent unnecessary wear.

3–20. Water Tank Strainer Screen

Service the strainer screen as instructed on figure 3–17.

3–21. Ballast Rolls Service

Service the ballast rolls as instructed on figure 3–18.

CORRECT BELT TENSION IS 1 2 IN. DEFLECTION MIDWAY BETWEEN PULLEYS.

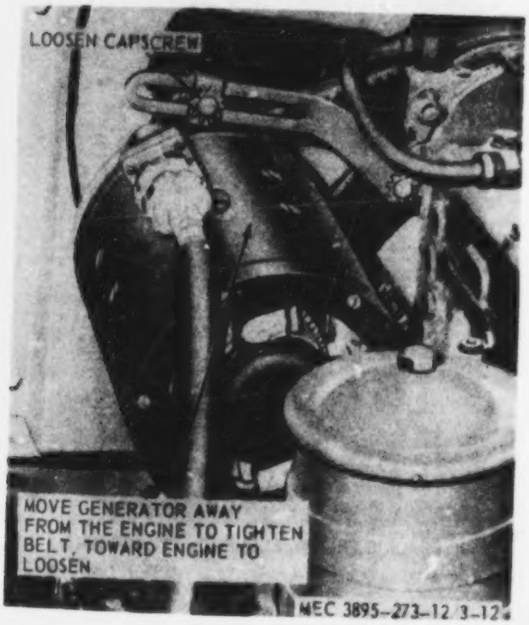

LOOSEN CAPSCREW
MOVE GENERATOR AWAY FROM THE ENGINE TO TIGHTEN BELT, TOWARD ENGINE TO LOOSEN.
MEC 3895–273–12 3–12

Figure 3–11. Fan Belt Adjustment.

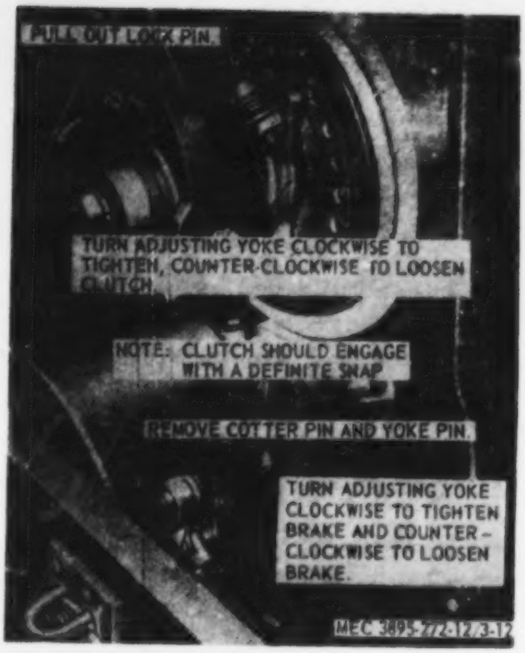

PULL OUT LOCK PIN.
TURN ADJUSTING YOKE CLOCKWISE TO TIGHTEN, COUNTER-CLOCKWISE TO LOOSEN CLUTCH.
NOTE: CLUTCH SHOULD ENGAGE WITH A DEFINITE SNAP
REMOVE COTTER PIN AND YOKE PIN.
TURN ADJUSTING YOKE CLOCKWISE TO TIGHTEN BRAKE AND COUNTER–CLOCKWISE TO LOOSEN BRAKE.
MEC 3895-272-12/3-12

Figure 3–12. Forward and reverse clutch and service brake adjustment.

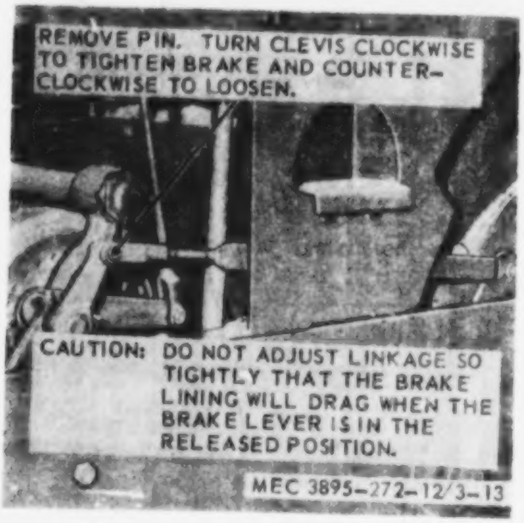
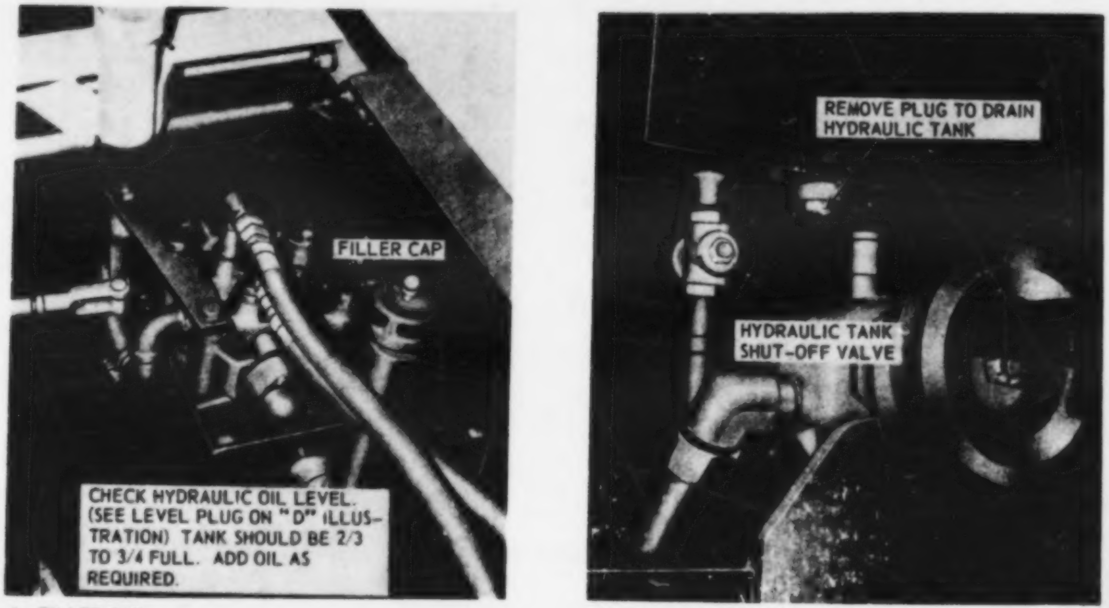

REMOVE PIN. TURN CLEVIS CLOCKWISE TO TIGHTEN BRAKE AND COUNTER–CLOCKWISE TO LOOSEN.
CAUTION: DO NOT ADJUST LINKAGE SO TIGHTLY THAT THE BRAKE LINING WILL DRAG WHEN THE BRAKE LEVER IS IN THE RELEASED POSITION.
MEC 3895–272–12/3–13

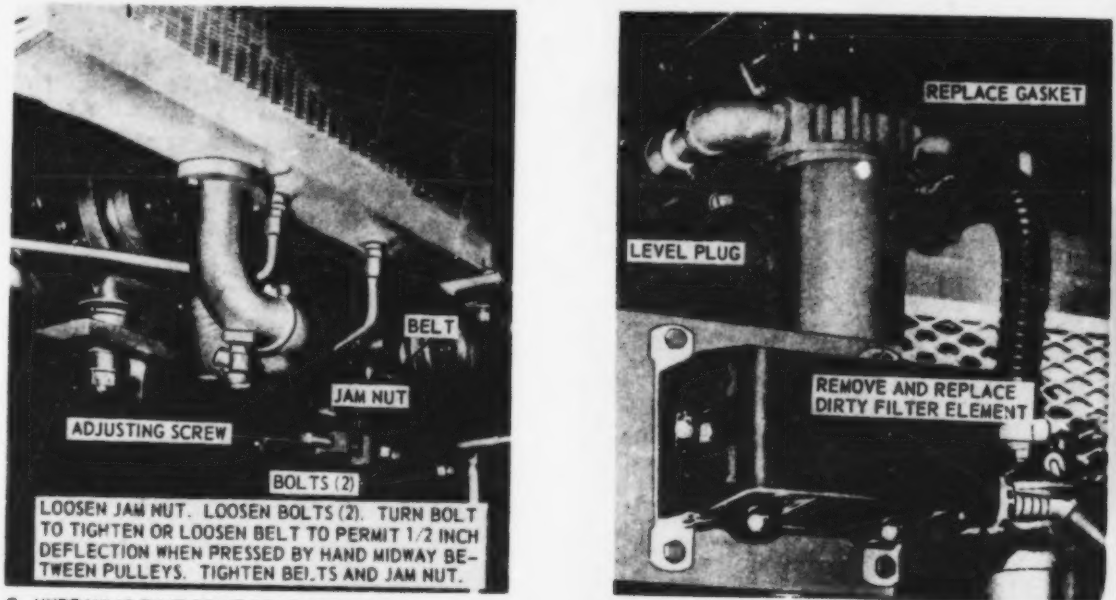
Figure 3–13. Parking brake adjustment.


FILLER CAP
REMOVE PLUG TO DRAIN HYDRAULIC TANK
HYDRAULIC TANK SHUT-OFF VALVE

CHECK HYDRAULIC OIL LEVEL. (SEE LEVEL PLUG ON "D" ILLUSTRATION) TANK SHOULD BE 2/3 TO 3/4 FULL. ADD OIL AS REQUIRED.

A. FILLER CAP.

B. TANK DRAIN AND SHUT-OFF VALVE.


BELT
JAM NUT
ADJUSTING SCREW
BOLTS (2)
REPLACE GASKET
LEVEL PLUG
REMOVE AND REPLACE DIRTY FILTER ELEMENT

LOOSEN JAM NUT. LOOSEN BOLTS (2). TURN BOLT TO TIGHTEN OR LOOSEN BELT TO PERMIT 1/2 INCH DEFLECTION WHEN PRESSED BY HAND MIDWAY BETWEEN PULLEYS. TIGHTEN BELTS AND JAM NUT.

C. HYDRAULIC PUMP DRIVE BELT ADJUSTMENT.

D. HYDRAULIC FILTER, ELEMENT REPLACEMENT.

MEC 3895-272-12/3-14

Figure 3-14. Hydraulic system service.

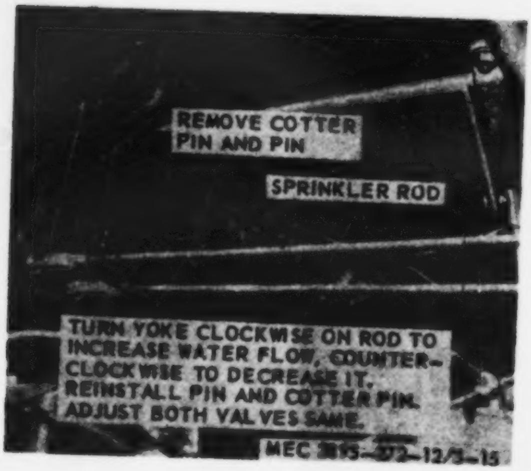
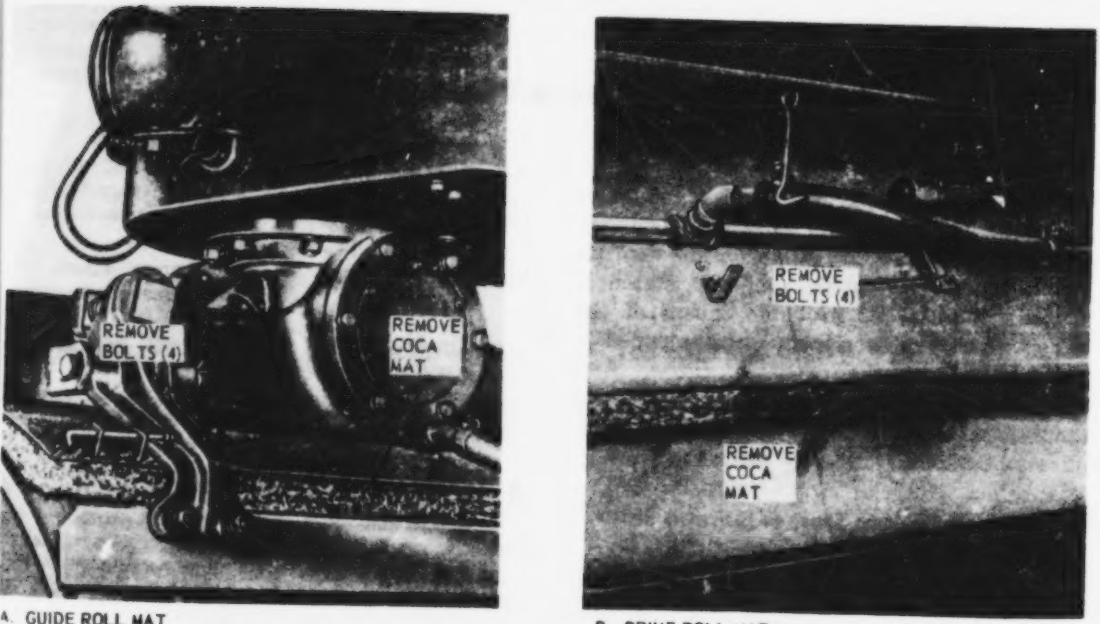

REMOVE COTTER PIN AND PIN
SPRINKLER ROD
TURN YOKE CLOCKWISE ON ROD TO INCREASE WATER FLOW, COUNTER-CLOCKWISE TO DECREASE IT. REINSTALL PIN AND COTTER PIN. ADJUST BOTH VALVES SAME.
MEC 3895-272-12/3-15

Figure 3-15. Sprinkler system adjustment.


REMOVE BOLTS (4)
REMOVE COCA MAT
REMOVE BOLTS (4)
REMOVE COCA MAT

A. GUIDE ROLL MAT

B. DRIVE ROLL MAT

MEC 3895-272-12 3-16

Figure 3-16. Mat replacement.

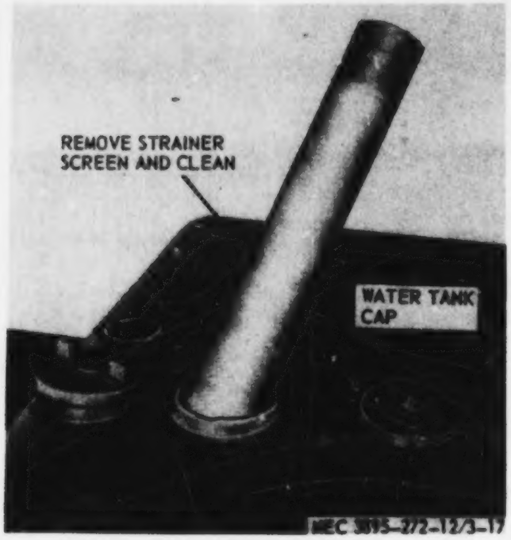


Figure 3-17. Water tank strainer screen service.

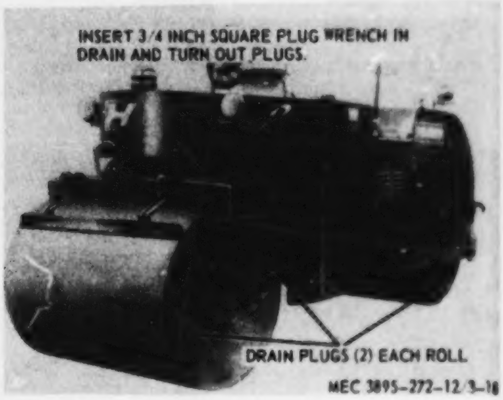

INSERT 3/4 INCH SQUARE PLUG WRENCH IN DRAIN AND TURN OUT PLUGS.
DRAIN PLUGS (2) EACH ROLL
MEC 3895-272-12/3-1

Figure 3-18. Ballast rolls service.

Section V. TROUBLESHOOTING

3-22. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the tandem roller and its components. Each trouble symptom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any trouble beyond the scope of the organizational maintenance shall be reported to direct support maintenance.

3-23. Engine Fails to Start or Hard to Start

Probable cause	Possible remedy
Fuel tank empty.	Fill fuel tank (para 3-6).
Fuel shutoff valve closed.	Open fuel shutoff valve (para 2-7).
Water in fuel lines.	Service fuel sediment bowl; drain fuel lines (paras 3-10, 3-11).
Plugged vent in fuel tank cap.	Open vent in cap.
Sediment bowl improperly installed; leaks air.	Inspect gasket. Install correctly (para 3-10).
Defective fuel pump.	Replace fuel pump (para 3-54).
Magneto points defective or out of adjustment.	Adjust points or replace magneto (para 3-65).
Engine out of time.	Time magneto to engine (para 3-65).
Defective spark plugs.	Clean, inspect, adjust, and replace faulty plugs (para 3-66).
Magneto condenser shorted.	Replace magneto (para 3-65).
Overspeed governor tripped.	Reset governor (para 3-67).

3-24. Engine Runs Unevenly

Probable cause	Possible remedy
Defective spark plugs.	Clean, adjust, or replace plugs (para 3-66).
Carburetor out of adjustment.	Adjust carburetor (para 3-55).
Magneto points defective or out of adjustment.	Adjust points or replace magneto (para 3-65).
Engine speed governor out of adjustment.	Adjust governor (para 3-58).
Air leaks in intake manifold.	Tighten loose manifold nuts (para 3-83).
Leaking head gasket.	Replace gasket (para 3-8
Cylinder compression uneven.	Adjust valves (para 3-84).

3-25. Engine Lacks Power

Probable cause	Possible remedy
Magneto out of time.	Time magneto to engine (para 3-65).
Clogged fuel strainer.	Service fuel strainer (para 3-54).
Poor fuel.	Use proper grade fuel.
Air leak in intake system.	Tighten manifold nuts, inspect air cleaner connections for tightness (paras 3-53, 3-83).
Engine speed governor set too low.	Adjust governor (para 3-58).

3-26. Engine Overheats

Probable cause	Possible remedy
Loss of coolant.	Replenish coolant. Check for leaks (para 3-12).
Fan belt slipping.	Adjust fan belt (para 3-13).
Air flow through radiator obstructed.	Clean radiator fins.
Engine overloaded.	Reduce load.
Crankcase oil level too low.	Check and replenish oil (para 3-3).
Defective thermostat.	Replace thermostat (para 3-75).
Clogged radiator.	Flush radiator, or replace (para 3-75).
Timing incorrect.	Time engine (para 3-65).
Back pressure in exhaust line.	Inspect exhaust system; replace plugged muffler (para 3-85).

3-27. Engine Makes Unusual Noises

Probable cause	Possible remedy
Valves out of adjustment.	Adjust valves (para 3-84).

3-28. Low Oil Pressure

Probable cause	Possible remedy
Crankcase oil low.	Check oil level and replenish as needed (para 3-3).
Oil too light; diluted.	Use proper grade oil, or change oil (para 3-3).
Oil pressure gauge or line faulty.	Replace faulty gauge or line (para 3-95).

3-29. High Oil Consumption

Probable cause	Possible remedy
Oil level too high in crankcase.	Check oil level. Fill to proper level (para 3-3).
Wrong grade oil used.	Use proper grade oil (para 3-3).
Clogged crankcase breather pipe.	Clean out breather pipe.

3-30. Excessive Fuel Consumption

Probable cause	Possible remedy
Carburetor out of adjustment.	Adjust carburetor (para 3-9).
Carburetor float sticks.	Replace carburetor (para 3-55).
Timing incorrect.	Time engine (para 3-65).

3-31. Engine Stops Suddenly

Probable cause	Possible remedy
Fuel tank empty	Fill fuel tank (para 3-11).
Restriction in fuel line.	Clean out fuel line (para 3-57).
Magneto capacitor shorted.	Replace capacitor (para 3-65).
Magneto coil burned out.	Replace magneto (para 3-65).
Overspeed governor tripped.	Reset and adjust governor (para 3-67).

3-32. Engine Surges (Speed Unsteady)

Probable cause	Possible remedy
Engine speed governor spring may need slight increase in tension.	Adjust governor (para 3-58).
Engine speed governor worn.	Replace governor (para 3-58).

3-33. Battery-Generator Indicator Will Not Indicate in Green Range

Probable cause	Possible remedy
Fan belt slipping.	Adjust fan belt (para 3-13).
Loose or broken connection in generator circuit.	Check out wiring. Repair wiring as required.
Defective regulator.	Replace regulator (para 3-63).
Generator brushes worn out.	Replace brushes (para 3-62).
Defective generator.	Replace generator (para 3-62).
Defective indicator.	Replace indicator (para 3-99).

3-34. Battery-Generator Indicator Reads in Low, Red Range

Probable cause	Possible remedy
Short in wiring or accessory.	Inspect wiring and electrical components for evidence of shorting, overheating. Repair as necessary.
Shorted battery cell or cells.	Replace battery (para 3-60).

3-35. Converter Oil Temperature Excessive

Probable cause	Possible remedy
Wrong gear speed used.	Use lower gear.
Operator stalls converter for too long time.	Refer to operating instructions.
Low oil supply.	Check oil level in torque converter and replenish as needed (para 3-4).

3-36. Converter Oil Pressure Too Low

Probable cause	Possible remedy
Oil level too low in converter.	Check oil level in converter and replenish (para 3-4).
Defective gage or sending unit.	Replace gage or sending unit (paras 3-100, 3-104).

3-37. Hydraulic Pump Noisy

Probable cause	Possible remedy
Air getting into suction line.	Check oil level in tank (paras 3-3, 3-17).
Hydraulic pump worn.	Replace hydraulic pump (para 3-113).

3-38. Guide Roll Steers Too Slowly

Probable cause	Possible remedy
Variable speed steering valve set too low.	Refer to operating instructions (para 2-11*c*(4)).
Engine idling.	Use adequate engine speed.
Low hydraulic pressure.	Adjust regulating valve to specified pressure (para 3-114).
Defective steering control valve.	Replace steering control valve (para 3-114).

3-39. Guide Roll Moves From Position

Probable cause	Possible remedy
Variable speed control valve set too low.	Refer to operating instructions (para 2-11*c*(4)).
Defective steering control valve.	Replace steering control valve (para 3-114).

3-40. Steering is Spongy

Probable cause	Possible remedy
Air in hydraulic lines.	Bleed lines at highest point. Exercise cylinder and bleed again to expel trapped air (para 3-110).

3-41. Guide Roller Slides: Roller Turns Poorly

Probable cause	Possible remedy
Dirt accumulation jams roll.	Clean dirt from rollers.

3-42. Rolls Become Grooved

Probable cause	Possible remedy
Extremely hard rock fill lodges behind scrapers.	Keep scrapers cleaned out when rolling this type of material.

3-43. Guide Roll Makes Depression in Asphalt after Stopping or Changing Direction

Probable cause	Possible remedy
Yoke kingpin bearings out of adjustment or damaged.	Adjust guide yoke, or replace damaged bearings (para 3-137).
Improper operator technique.	Refer to operating instructions for rolling pavement (paras 2-11, 2-14).

3-44. Service Brake or Parking Brake Fails to Hold

Probable cause	Possible remedy
Brake out of adjustment.	Adjust brakes (paras 3-15, 3-16).
Grease-soaked discs.	Clean discs with cleaning solvent.

3-45. Roller Hesitates or Does Not Move Forward or Backward

Probable cause	Possible remedy
Clutch, or clutches slipping.	Adjust clutches (para 3-14).
Torque converter oil level low.	Check oil level in converter. Replenish as necessary (para 3-3).

3-46. Gears Clash when Shifting

Probable cause	Possible remedy
Improper operator technique.	Roller must be stopped when changing gear ratio. Refer to operating instructions.

Section VI. RADIO INTERFERENCE SUPPRESSION

3-47. Definitions

a. Interference. The term "interference" as used herein applies to electrical disturbances in the radio frequency range which are generated by the tandem roller and which may interfere with the proper operation of radio receivers or other electrical equipment or enable the enemy to locate the equipment.

b. Interference Suppression. The term "interference suppression" as used herein applies to the methods used to eliminate or effectively reduce radio interference generated by the tandem roller.

3-48. General Methods Used to Attain Proper Suppression

Essentially, suppression is attained by providing a low resistance path to ground for the stray currents. The methods used to attain suppression include shielding the ignition and high-frequency wires, grounding the frame with bonding straps, and using capacitors and resistors where necessary.

3-49. Interference Suppression Components

a. Primary suppression components used to overcome the electrical disturbances generated by the tandem roller consist of internal-toothed lockwashers installed under the heads and under the nuts of the attaching hardware to the side of roller frame.

b. Secondary suppression components, which are incidental to the primary, include a condenser in the magneto assembly. Also, grounding straps on the engine and instrument panel help in this function.

3-50. Replacement of Suppression Components

As indicated above, the components which may require replacement are the internal-toothed lockwashers under the heads of bolts and under nuts in any place where electrical components are bolted, and under grounding straps and electrical system leads. Also, the magneto assembly contain a condenser, which may require replacement if the problem of interference is experienced.

3-51. Testing of Radio Interference Suppression Components

Test the capacitors for leaks and shorts on a capacitor tester; replace defective capacitors. If test equipment is not available and interference is indicated, isolate cause by the trial-and-error method of replacing each capacitor in turn until the cause of interference is located and eliminated.

Section VII. ENGINE FUEL SYSTEM

3-52. Description

The fuel system consists of a carburetor, fuel pump, and strainer assembly, air cleaner, fuel tank, lines, and fittings. Fuel is delivered from the fuel tank to the carburetor by the fuel pump. The air cleaner prevents dirt, dust, and foreign material from entering the engine. A centrifugal type governor maintains a constant engine speed.

3-53. Air Cleaner

a. Removal. Remove the air cleaner from the roller as instructed on figure 3-19.

b. Disassembly.

(1) Remove the clamp (4, fig. 3-20), outer oil cup (3), and inner oilcup (2) from the body (1).

(2) Remove the two bands (5) from the body (1).

c. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Repair or replace defective or damaged parts.

d. Reassembly.

(1) Install the two bands (5) on the body (1).

(2) Install the inner oil cup (2), outer oil cup (3), and the clamp (4) on the body (1).

e. Installation. Install the air cleaner on the roller in reverse of the instructions on figure 3-19.

3-54. Fuel Pump

a. Removal. Remove the fuel pump from the engine as instructed on figure 3-21.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the fuel pump for wear, leaks, defects, and damage.

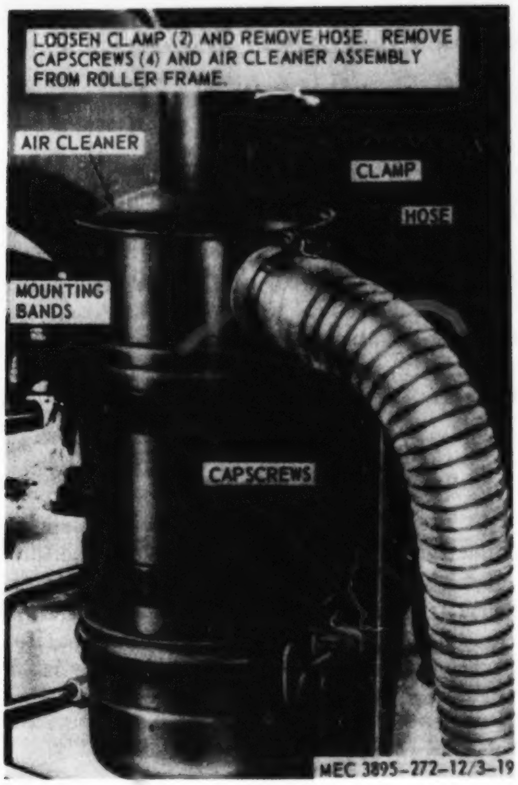

LOOSEN CLAMP (2) AND REMOVE HOSE. REMOVE CAPSCREWS (4) AND AIR CLEANER ASSEMBLY FROM ROLLER FRAME.

Figure 3-19. Air cleaner, removal and installation.

(3) Replace a worn, damaged, or defective fuel pump.

e. Installation. Install the fuel pump in reverse of the instructions on figure 3-21. Put new gasket in between pump-flange and pad.

3-55. Carburetor

a. Removal.

(1) Disconnect the control linkage from the carburetor.
(2) Remove air cleaner hose from carburetor.
(3) Remove the carburetor as instructed on figure 3-22.

b. Cleaning, Inspection, and Repair.

(1) Clean the carburetor with approved cleaning solvent.
(2) Perform the service, as required, on the carburetor (para *d*).
(3) Inspect the carburetor for damage, loose screws, wear in the throttle valve shaft, and other defects.
(4) Replace a defective carburetor.

c. Installation.

(1) Install the carburetor in reverse of the instructions on figure 3-22. Put in new gasket between flange and mounting pad.
(2) Connect the control linkage to the carburetor.
(3) Connect air cleaner hose to carburetor.
(4) Adjust the carburetor (par 3-9).

d. Service.

(1) Service the carburetor as instructed on figure 3-22.
(2) Adjust the carburetor (para 3-9).

3-56. Fuel Level Sending Unit

a. Removal. Remove the fuel level sending unit as instructed on figure 3-23.

b. Cleaning, Inspection, and Repair.

(1) Clean the sending unit with an approved cleaning solvent.
(2) Inspect the float for evidence of fuel soaking.
(3) Inspect for poor electrical connections, damaged wiring, and such. Replace a defective sending unit.

c. Installation. Install the fuel level sending unit in reverse of the instructions on figure 3-23.

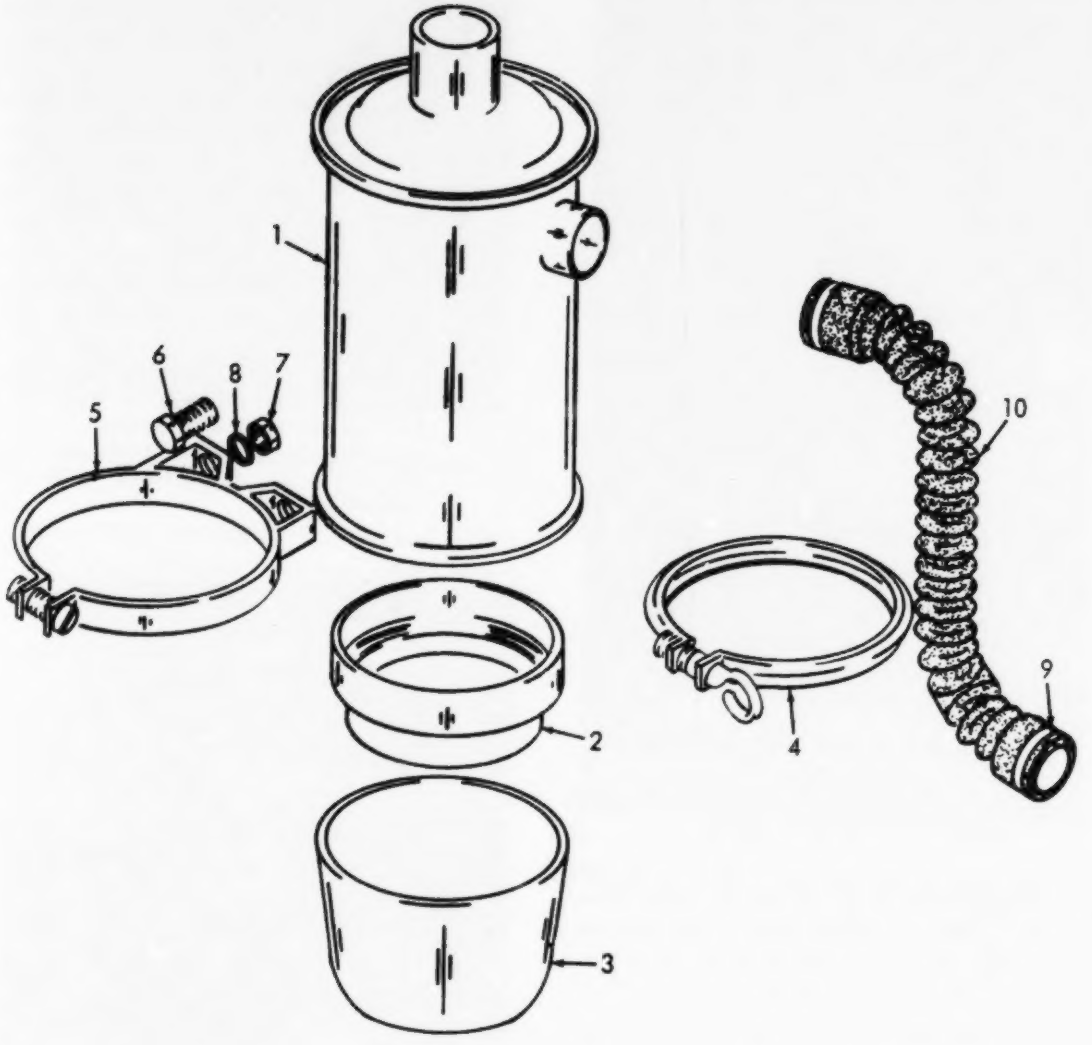
3-57. Fuel Tank

a. Removal. Remove the fuel tank as instructed on figure 3-24.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent, including fuel lines.
(2) Inspect the tank and line for leaks and damage. Replace leaking or damaged parts.

c. Installation. Install the fuel tank in reverse of the instructions on figure 3-24.



MEC 3895-272-12/3-20

1 Body
2 Inner oil cup
3 Outer oil cup
4 Clamp
5 Band (2)
6 Screw (4)
7 Nut (4)
8 Washer (4)
9 Clamp (2)
10 Hose

Figure 3-20. Air cleaner, exploded view.

3-58. Engine Speed Governor

a. *Adjustment.* (figure 3-25, A)

(1) Disconnect the hand throttle linkage from the governor lever A and place the hand throttle control in the fully open position (rearward).

(2) Disconnect the governor-to-carburetor rod from lever B.

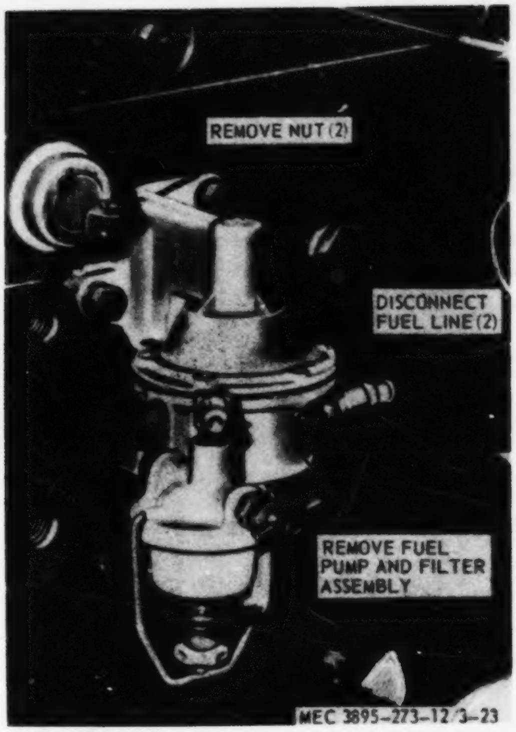

REMOVE NUT (2)
DISCONNECT FUEL LINE (2)
REMOVE FUEL PUMP AND FILTER ASSEMBLY
MEC 3895–273–12/3–23

Figure 3–21. Fuel pump, removal and installation.

(3) Loosen jam nuts and back out governor stop screws 1 and 2.

(4) With hand throttle lever and the governor lever A in the fully open position, adjust the hand throttle linkage until the pin holes are alined. Connect the linkage.

(5) Place the hand throttle control in the idle position and the carburetor throttle lever against the idle stop. Adjust the governor-to-carburetor rod ball joint to just slide into the lever B; then lengthen rod two turns and tighten locknut. Connect rod to lever B.

(6) Start the engine in the idle position and check idle rpm. Adjust the carburetor throttle stop screw to obtain 500—700 rpm. Loosen locknut A and tighten nut B until the idle rpm starts to increase; backoff nut B slightly and tighten locknut A.

(7) Advance the hand throttle control to the full open position and check rpm. If rpm is low (below 2100), loosen locknut A and tighten locknut B until 2100 rpm is attained. Return throttle to idle position and recheck idle rpm; if high, lengthen the governor-to-carburetor rod until 500 to 700 rpm is attained.

Note. If engine surges at idle speed, lengthen the governor-to-carburetor rod slightly.

Note. Difficulty may be experienced obtaining both the specified high and low rpm settings due to peculiarities within a particular governor. In this case, some compromise may be necessary in the low rpm setting.

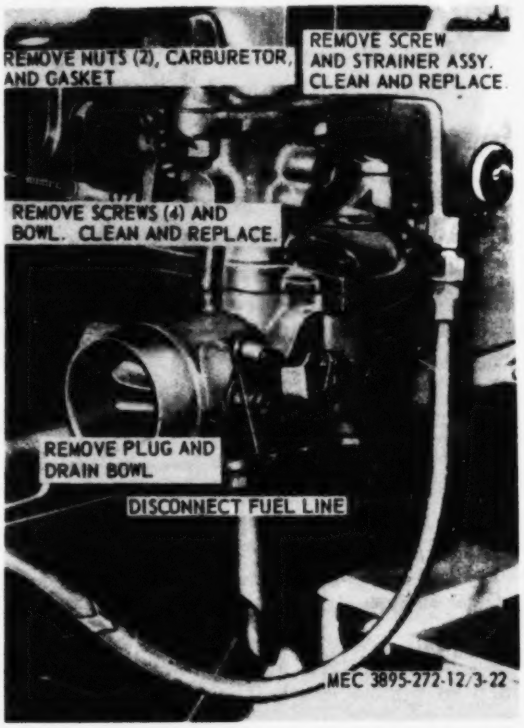

REMOVE NUTS (2), CARBURETOR, AND GASKET
REMOVE SCREW AND STRAINER ASSY. CLEAN AND REPLACE
REMOVE SCREWS (4) AND BOWL. CLEAN AND REPLACE.
REMOVE PLUG AND DRAIN BOWL
DISCONNECT FUEL LINE
MEC 3895-272-12/3-22

Figure 3–22. Carburetor, removal, installation, and service.

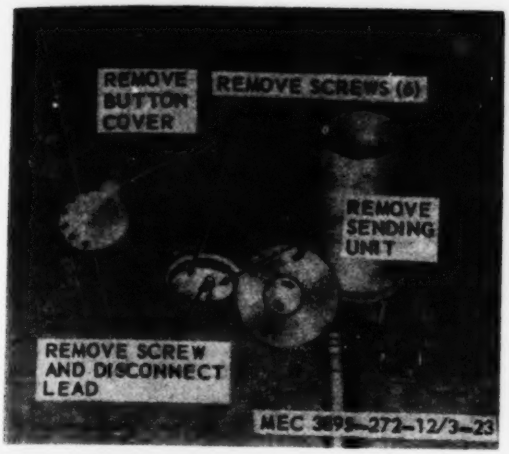

REMOVE BUTTON COVER
REMOVE SCREWS (6)
REMOVE SENDING UNIT
REMOVE SCREW AND DISCONNECT LEAD
MEC 3895-272-12/3-23

Figure 3-23. Fuel level sending unit, removal and installation.

(8) After governor is adjusted, open hand throttle and turn lockscrew 1 in until it just touches stop. Tighten jam nut. Close hand throttle and turn in lockscrew 2 until it just touches stop. Tighten jam nut. Press button on overspeed governor to reset.

b. Removal. Remove the engine speed governor as illustrated on figure 3-25, B.

c. Cleaning, Inspection, and Repair.

(1) Clean the governor with a cloth and approved cleaning solvent.

(2) Inspect the governor for damaged or excessively worn drive gear teeth.

(3) Check governor for excessive wear in lever shafts and other defects.

(4) Replace a defective governor.

d. Installation.

(1) Install the engine speed governor in reverse of the instructions on figure 3-25, B.

(2) Adjust the engine speed governor (para *a.*).

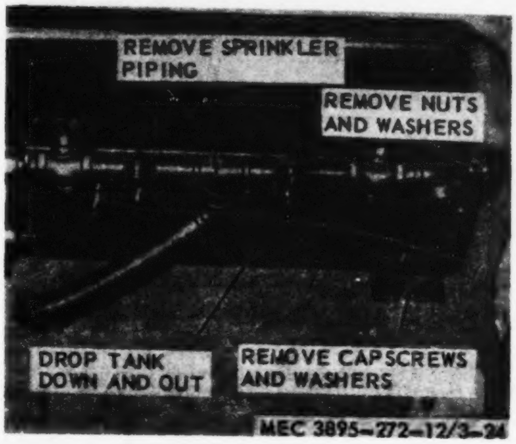
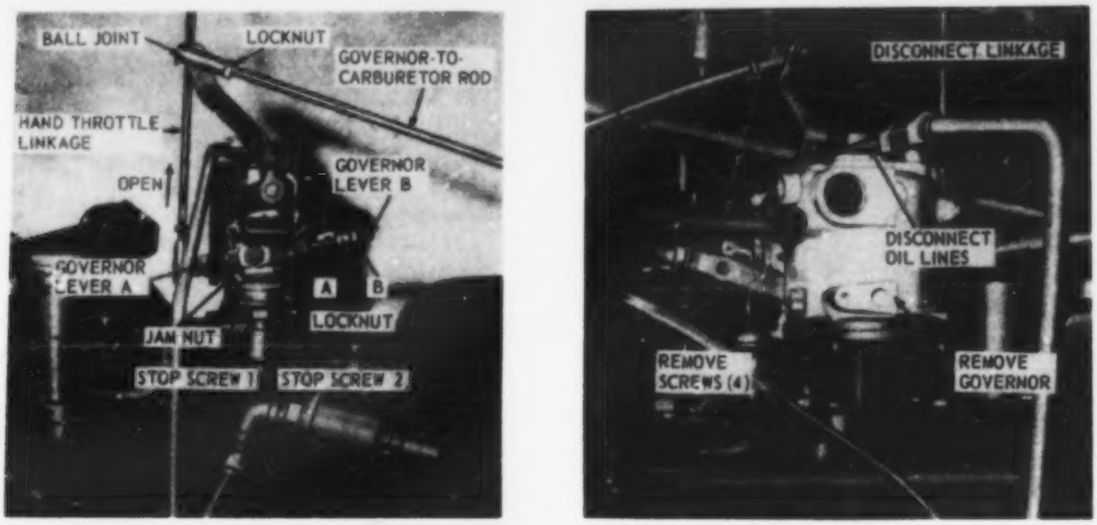

REMOVE SPRINKLER PIPING
REMOVE NUTS AND WASHERS
DROP TANK DOWN AND OUT
REMOVE CAPSCREWS AND WASHERS
MEC 3895-272-12/3-24

Figure 3-24. Fuel tank, removal and installation.


BALL JOINT
LOCKNUT
GOVERNOR-TO-CARBURETOR ROD
HAND THROTTLE LINKAGE
OPEN
GOVERNOR LEVER B
GOVERNOR LEVER A
A
B
LOCKNUT
JAM NUT
STOP SCREW 1
STOP SCREW 2
DISCONNECT LINKAGE
DISCONNECT OIL LINES
REMOVE SCREWS (4)
REMOVE GOVERNOR

A. ADJUSTMENT.

B. REMOVAL AND INSTALLATION

MEC 3895-272-12/3-25

Figure 3-25. Engine speed governor, adjustment, removal, and installation.

Section VIII. ELECTRICAL SYSTEM

3-59. Description

The electrical system of the roller is 24 volt, negative ground. It consists of a generator, generator regulator, starter and solenoid, gages and wiring, and two 12-volt batteries. Power is supplied by the batteries for starting the engine and is replenished by the generator. The current and voltage delivered by the generator is controlled by the regulator to maintain the batteries at full charge. The ignition system consists of a magneto, spark plugs, and shielded wiring.

3-60. Batteries and Battery Cables

a. Removal. Remove the batteries and battery cables as instructed on figure 3-26.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the batteries for cracks, loose or broken terminals, and other damage. Test cells with a suitable tester and check specific gravity. See table 2-1, Chapter 2, Section I. Replace defective batteries.

(3) Inspect cables for fraying, corrosion, and damage. Replace defective cables.

c. Installation. Install the batteries and cables in reverse of the instructions on figure 3-26.

3-61. Battery Frame Assembly

a. Removal.

(1) Remove the batteries (para 3-60).

(2) Remove the battery frame assembly as instructed on figure 3-26.

b. Cleaning, Inspection, and Repair.

(1) Steam clean the battery frame. Remove all corrosion from frame.

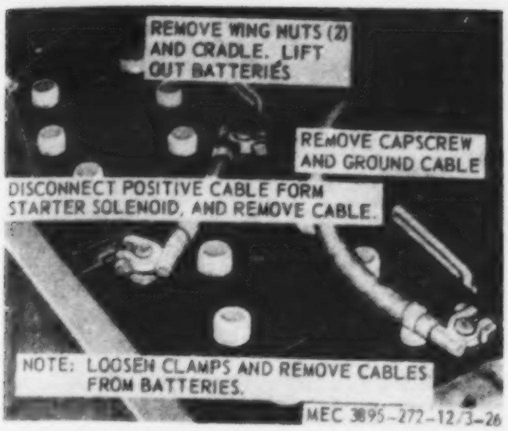
(2) Inspect the frame for cracks, broken weld, or other damage.

(3) Repair a damaged frame by welding and/or straightening.

c. Installation.

(1) Install the battery frame in reverse of the instructions on figure 3-26.

(2) Install the batteries (para 3-60).



REMOVE WING NUTS (2) AND CRADLE. LIFT OUT BATTERIES

REMOVE CAPSCREW AND GROUND CABLE

DISCONNECT POSITIVE CABLE FORM STARTER SOLENOID, AND REMOVE CABLE.

NOTE: LOOSEN CLAMPS AND REMOVE CABLES FROM BATTERIES.

Figure 3-26. Batteries and battery cables, removal and installation.

3-62. Generator

a. Removal. Remove the generator as instructed on figure 3-27.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the brushes for wear and damage. Brushes that have worn to 1/2 inch or less in length should be replaced. Replace brushes as necessary. Refer to paragraph *d.*

(3) Inspect the generator for damage and proper operation. Replace a damaged or defective generator.

c. Installation.

(1) Install the generator and drive belt in reverse of the instructions on figure 3-27.

(2) Adjust the generator drive fan belt (para 3-13).

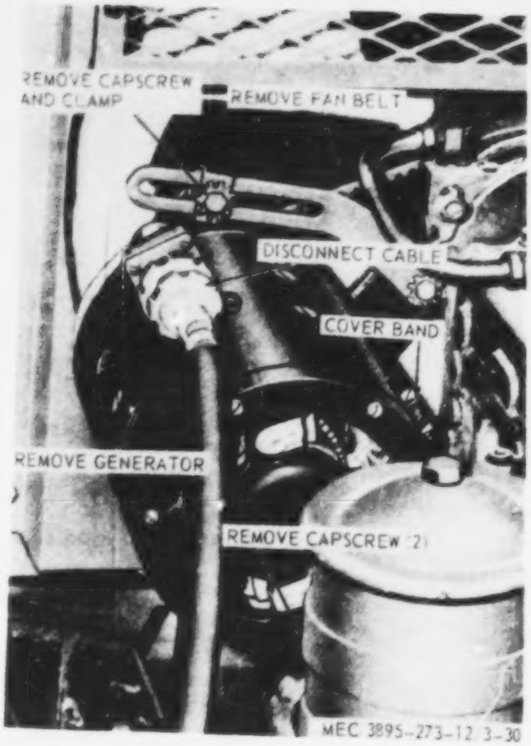
d. Generator Brush Replacement.

(1) Remove cover band from generator (fig. 3-27).

(2) Remove brushes as instructed on figure 3-28.

(3) Inspect the commutator for severe pitting, grooving, discoloration, or high mica between segments.

(4) Install new brushes in reverse of the instructions on figure 3-28.



REMOVE CAPSCREW AND CLAMP

REMOVE FAN BELT

DISCONNECT CABLE

COVER BAND

REMOVE GENERATOR

REMOVE CAPSCREW (2)

Figure 3-27. Generator, removal and installation.

(5) Seat new brushes preferably by running the generator and holding a commutator stone against the commutator for a minute or two. An alternate method is to place a strip of sandpaper face up around the commutator and under the brushes. Rotate the armature by hand until the brushes conform to the shape of the commutator.

3-63. Generator Regulator

a. Removal. Remove the generator regulator as instructed on figure 3-29.

b. Cleaning and Inspection.

(1) Clean the generator regulator with a cloth and approved cleaning solvent.

(2) Inspect the regulator for defects and damage. Replace a defective or damaged regulator.

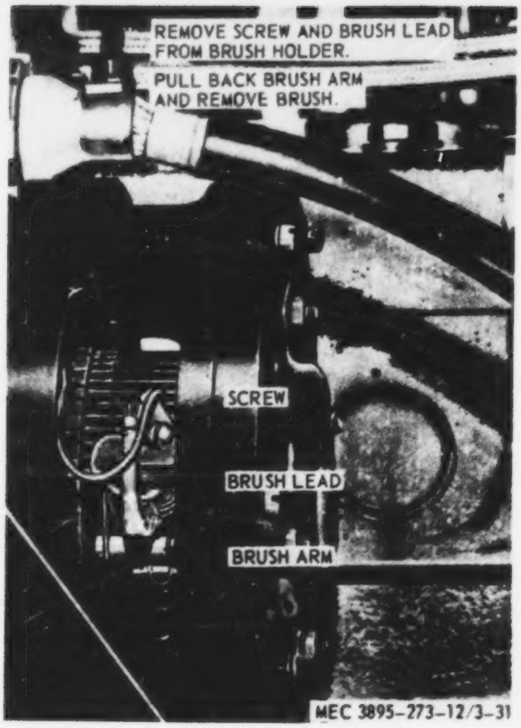

REMOVE SCREW AND BRUSH LEAD FROM BRUSH HOLDER.
PULL BACK BRUSH ARM AND REMOVE BRUSH.
SCREW
BRUSH LEAD
BRUSH ARM
MEC 3895-273-12/3-31

Figure 3-28. Generator brush replacement.

c. Installation. Install the generator regulator in reverse of the instructions on figure 3-29.

3-64. Starter and Solenoid

a. Removal. Remove the starter and solenoid as instructed on figure 3-30.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the starter for wear, defects, and damage. Replace a worn, defective, or damaged starter.

(3) Inspect the solenoid switch for defects and damage. Check for continuity between terminals with switch in engaged position. Replace a defective solenoid switch.

c. Installation. Install the starter and solenoid in reverse of the instructions on figure 3-30.

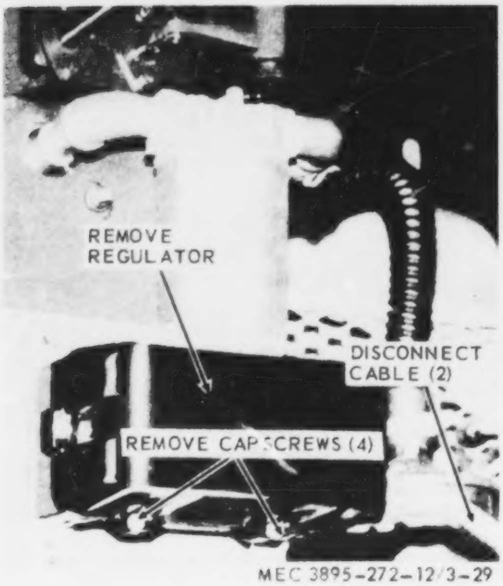

REMOVE REGULATOR
DISCONNECT CABLE (2)
REMOVE CAPSCREWS (4)
MEC 3895-272-12/3-29

Figure 3-29. Generator regulator, removal and installation.

3-65. Magneto

a. Removal.

(1) Disconnect the ground wire (fig. 3-31).

(2) Remove the magneto from the engine as instructed on figure 3-31.

b. Disassembly.

(1) Remove four screws which hold terminal block in end cap (fig. 3-32 A).

(2) Remove leads and terminal block.

(3) Remove four screws, end cap and gasket.

c. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent. Dry thoroughly.

(2) Inspect the magneto for wear, defects, and damage. Replace a worn, defective, or damaged magneto.

(3) Inspect the contact points for deep pitting or burning. Replace points as instructed on figure 3-32 B.

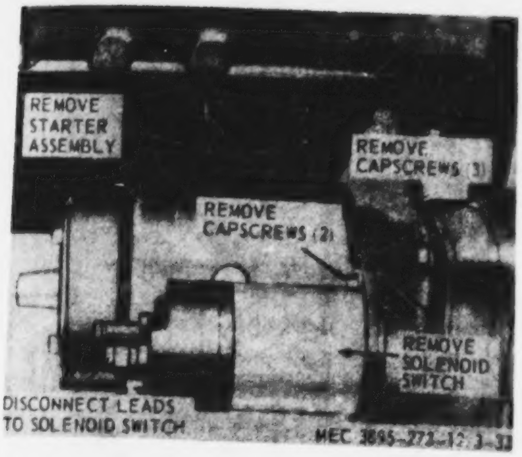

REMOVE STARTER ASSEMBLY
REMOVE CAPSCREWS (3)
REMOVE CAPSCREWS (2)
REMOVE SOLENOID SWITCH
DISCONNECT LEADS TO SOLENOID SWITCH
MEC 3895-272-12/3-30

Figure 3–30. Starter and solenoid, removal and installation.

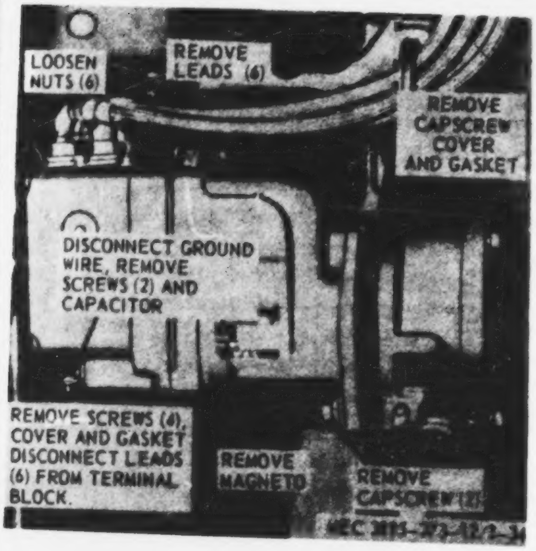

LOOSEN NUTS (6)
REMOVE LEADS (6)
REMOVE CAPSCREW COVER AND GASKET
DISCONNECT GROUND WIRE, REMOVE SCREWS (2) AND CAPACITOR
REMOVE SCREWS (4), COVER AND GASKET DISCONNECT LEADS (6) FROM TERMINAL BLOCK.
REMOVE MAGNETO
REMOVE CAPSCREW (2)
MEC 3895-272-12/3-31

Figure 3–31. Magneto, removal and installation.

(4) Test the capacitor for an open or short-circuited condition. Replace if defective.

d. Contact Point Adjustment. Adjust the contact points as instructed on figure 3–32 C.

e. Reassembly. Install end cap terminal block and capacitor.

f. Timing and Installation. Aline the timing marks as shown on figure 3–33. Install the magneto in reverse of the instructions on figure 3–31.

3–66. Spark Plugs and Cables

a. Removal. Remove the spark plugs and cables as instructed on figure 3–34.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Clean and test spark plugs with a suitable tester. Replace defective spark plugs.

(3) Check spark plug gap. Correct gap is 0.025 inches for standard plugs; 0.035 for resistor type plugs.

(4) Inspect cables for frayed or damaged insulation, broken leads, and damaged connectors. Replace defective cables.

c. Installation. Install the spark plugs and cables in reverse of the instructions of figure 3–34.

3–67. Overspeed Governor

a. Removal. Remove the overspeed governor as instructed on figure 3–35.

b. Cleaning, Inspection and Repair.

(1) Clean the overspeed governor with a cloth and cleaning solvent.

(2) Inspect the governor for damage, loose components, rough turning shaft, or other defects. Replace a defective governor.

c. Installation. Install the overspeed governor in reverse of the instructions on figure 3–35.

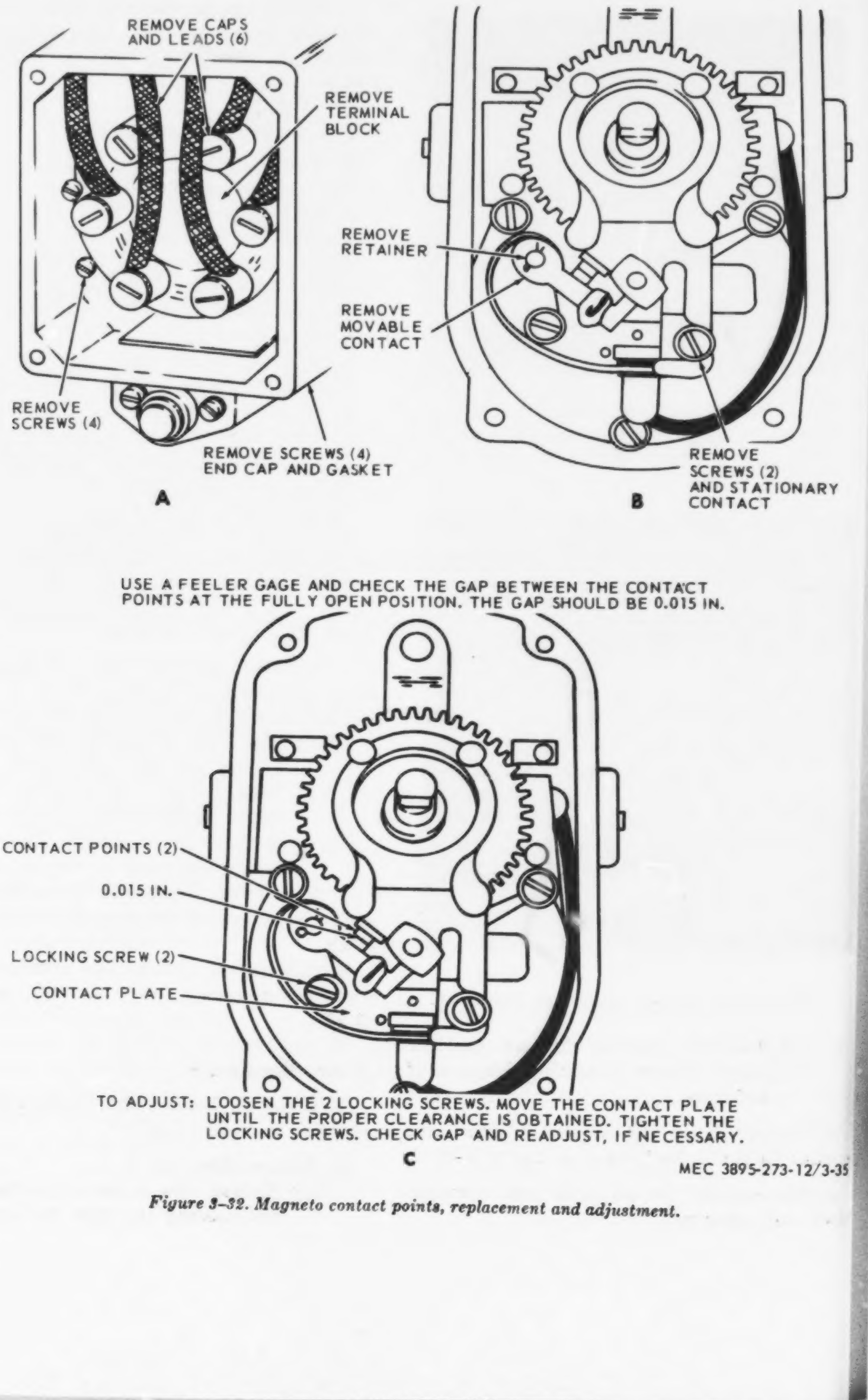
d. Adjustment. Adjust the overspeed governor, if necessary, as instructed on figure 3–36.

3–68. Floodlamps

a. Removal. Remove the floodlamps as instructed on figure 3–37.

b. Disassembly.

(1) Remove the screw (6, Fig. 3–38) and molding (5) from the body (1).

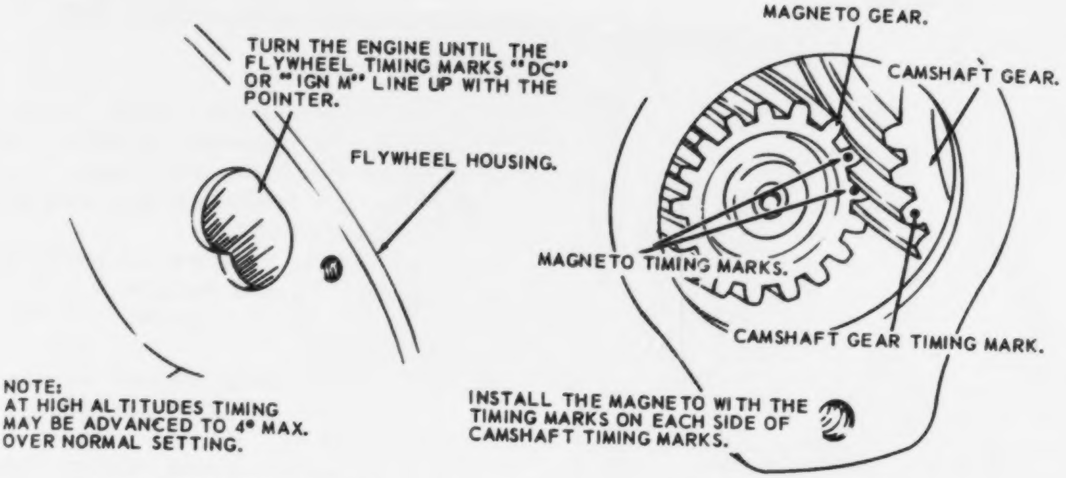

REMOVE CAPS AND LEADS (6)
REMOVE TERMINAL BLOCK
REMOVE SCREWS (4)
REMOVE SCREWS (4) END CAP AND GASKET
A
REMOVE RETAINER
REMOVE MOVABLE CONTACT
REMOVE SCREWS (2) AND STATIONARY CONTACT
B
CONTACT POINTS (2)
0.015 IN.
LOCKING SCREW (2)
CONTACT PLATE
C

USE A FEELER GAGE AND CHECK THE GAP BETWEEN THE CONTACT POINTS AT THE FULLY OPEN POSITION. THE GAP SHOULD BE 0.015 IN.

TO ADJUST: LOOSEN THE 2 LOCKING SCREWS. MOVE THE CONTACT PLATE UNTIL THE PROPER CLEARANCE IS OBTAINED. TIGHTEN THE LOCKING SCREWS. CHECK GAP AND READJUST, IF NECESSARY.

MEC 3895-273-12/3-3

Figure 3-32. Magneto contact points, replacement and adjustment.

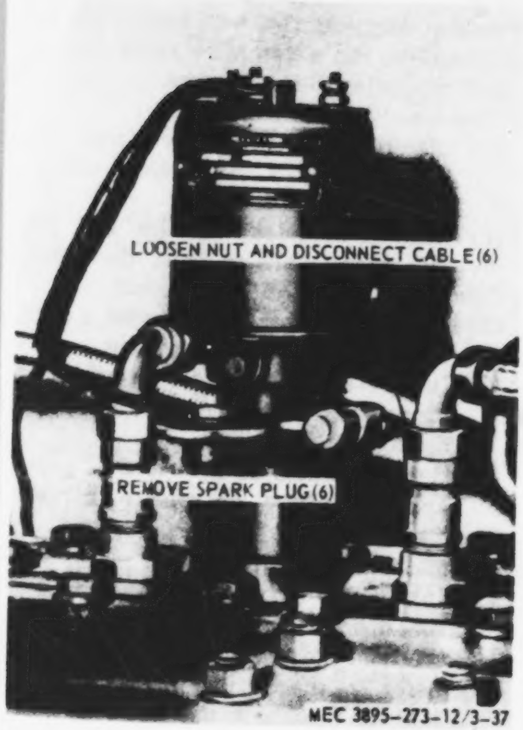

TURN THE ENGINE UNTIL THE FLYWHEEL TIMING MARKS "DC" OR "IGN M" LINE UP WITH THE POINTER.
FLYWHEEL HOUSING.
NOTE:
AT HIGH ALTITUDES TIMING MAY BE ADVANCED TO 4° MAX. OVER NORMAL SETTING.
MAGNETO GEAR.
CAMSHAFT GEAR.
MAGNETO TIMING MARKS.
CAMSHAFT GEAR TIMING MARK.
INSTALL THE MAGNETO WITH THE TIMING MARKS ON EACH SIDE OF CAMSHAFT TIMING MARKS.

A. FLYWHEEL TIMING MARK.

B. TIMING GEAR MARKS.

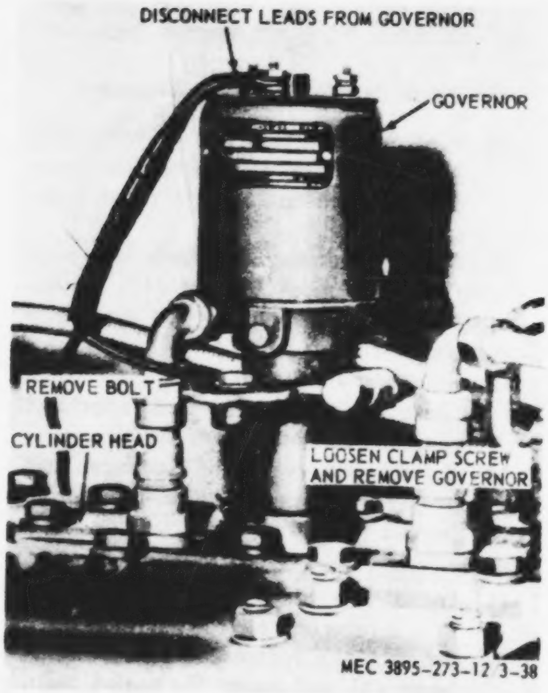
MEC 3895-273-12/3-36

Figure 3-33. Magneto timing marks.


LOOSEN NUT AND DISCONNECT CABLE (6)
REMOVE SPARK PLUG (6)

MEC 3895-273-12/3-37

Figure 3-34. Spark plugs and cables, removal and installation.


DISCONNECT LEADS FROM GOVERNOR
GOVERNOR
REMOVE BOLT
CYLINDER HEAD
LOOSEN CLAMP SCREW AND REMOVE GOVERNOR

MEC 3895-273-12 3-38

Figure 3-35. Overspeed governor, removal and installation.

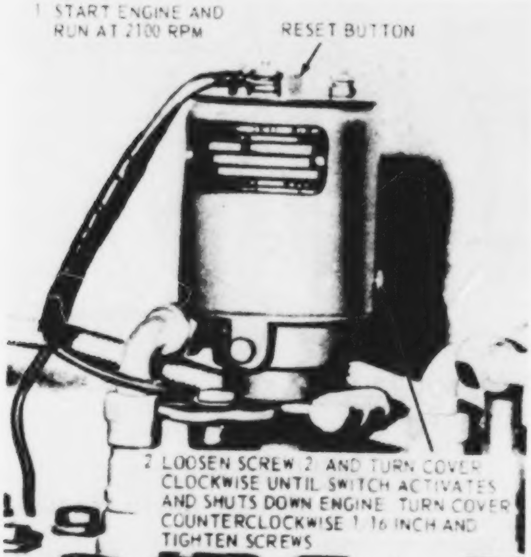

1 START ENGINE AND RUN AT 2100 RPM
RESET BUTTON
2 LOOSEN SCREW (2) AND TURN COVER CLOCKWISE UNTIL SWITCH ACTIVATES AND SHUTS DOWN ENGINE. TURN COVER COUNTERCLOCKWISE 1/16 INCH AND TIGHTEN SCREWS
MEC 3895-273-12/3-39

Figure 3-36. Overspeed governor, adjustment.

(2) Remove the screw (6) and molding (7), disconnect the receptacle from the sealed beam (3) and remove the sealed beam.

(3) Remove the ring (4) from the body (1) and remove the nut (10), washer (9), and the plate (8) from the body (1).

c. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for damage and proper operation. Replace defective parts.

d. Reassembly.

(1) Install the ring (4), molding (5), and screw (6) on the body (1).

(2) Connect the receptacle to the sealed beam (3) and insert the sealed beam unit in the body (1).

(3) Install the molding (7) and screw (6) on the ring (4).

e. Installation. Install the floodlamps in reverse of the instructions on figure 3-37.

3-69. Circuit Breakers

a. Removal. Remove the circuit breakers from the roller as instructed on figure 3-39.

b. Cleaning, Inspection, and Repair.

(1) Clean the breakers with a cloth and cleaning solvent.

(2) Inspect the breakers for continuity, and for signs of damage.

(3) Replace faulty breakers.

c. Installation.

(1) Install the circuit breakers and panel in reverse of the instructions on figure 3-39.

(2) Refer to the wiring diagram (fig. 1-4) and connect the leads.

3-70. Wiring and Wiring Harness

a. Repair. If an electrical lead becomes broken, insulation torn or deteriorated, repair by splicing a new lead to the old, affixing terminals as required. If a wire fails inside the wiring harness, run a new wire along the outside and tape wire to the harness.

b. Removal.

(1) Disconnect wire leads from the switches, lights, and other components of the roller.

(2) Remove hold-down clamps and lift the wiring harness from the roller.

c. Cleaning, Inspection, and Repair.

(1) Clean the wiring harness with a cloth dampened in cleaning solvent.

(2) Inspect the harness for deteriorated insulation, broken leads, and other damage.

(3) Repair harness as described in paragraph *a.* above, or replace harness assembly.

d. Installation.

(1) Install the wiring harness on the roller, securing it to the frame with the hold down clamps.

(2) Refer to the wiring diagram (fig. 1-4) and connect the leads to the instruments, switches and electrical components of the roller.

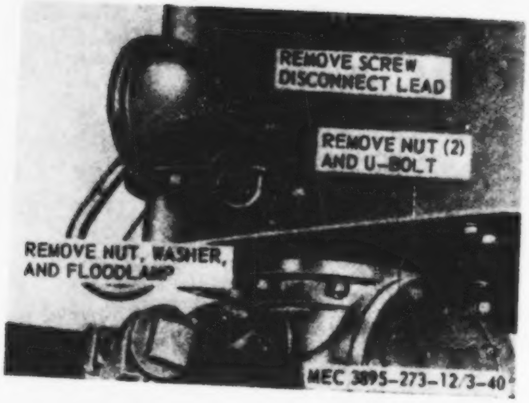
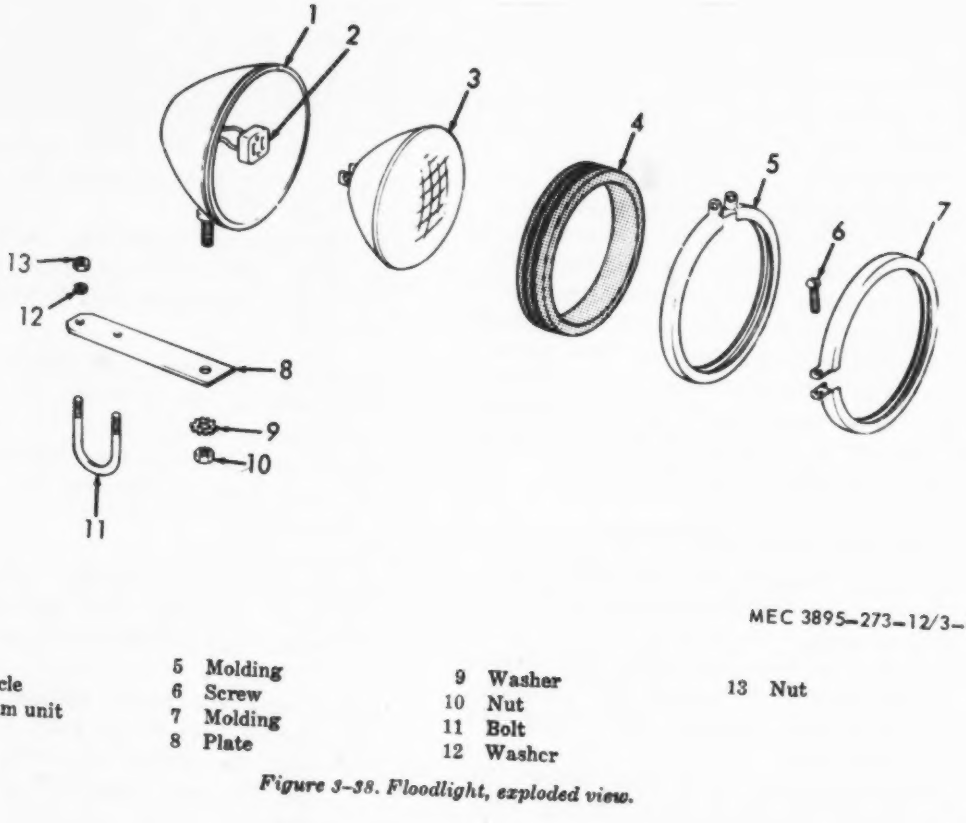

REMOVE SCREW
DISCONNECT LEAD
REMOVE NUT (2)
AND U-BOLT
REMOVE NUT, WASHER,
AND FLOODLAMP
MEC 3895-273-12/3-40

Figure 3-37. Floodlamps, removal and installation.


1
2
3
4
5
6
7
13
12
8
9
10
11

MEC 3895-273-12/3-41

1 Body
2 Receptacle
3 Seal beam unit
4 Ring
5 Molding
6 Screw
7 Molding
8 Plate
9 Washer
10 Nut
11 Bolt
12 Washer
13 Nut

Figure 3-38. Floodlight, exploded view.

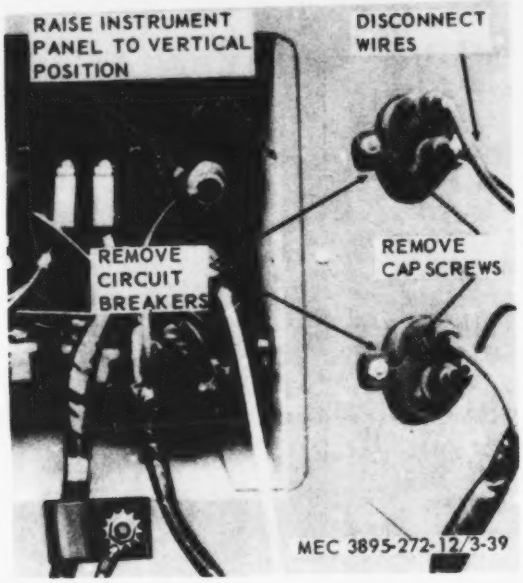


Figure 3-39. Circuit breaker, removal and installation.

Section IX. LUBRICATION SYSTEM

3-71. Description

The lubrication system of the engine consists of an oil pump, oil filter, lines, and fittings. Oil is pumped from the engine crankcase by the oil pump through internal passages in the cylinder block to the crankshaft, camshaft, and timing gears. The oil then passes through the oil filter and returns to the crankcase. An oil pressure regulator valve located in the side of the cylinder block maintains a pressure of between 20 and 30 psi.

3-72. Oil Filter, Lines, and Fittings

a. Removal. Remove the oil filter, lines, and fittings as instructed on figure 3-40.

b. Disassembly.

(1) Remove the nuts (27), (fig. 3-41), washers (28), screws (32), washers (31), and bracket (33) from the filter (7).

(2) Remove the screw (3), gasket (2), cover (1), gasket (4), spring (34), and element (5) from the body (7).

(3) Remove the nuts (30), washers (29), screws (6), and straps (8), from the body (7).

(4) Remove the connector (9), connector (22), plug (26), tee (25), bushing (23), and nipple (24) from the body (7).

c. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

d. Reassembly.

(1) Install the connector (22), nipple (24), bushing (28), tee (25), plug (26), and connector (9) on the body (7).

(2) Install the filter element (5) and spring (34) in the body (7) and install the gasket (4), cover (1), gasket (2), and screw (3) on the body (7).

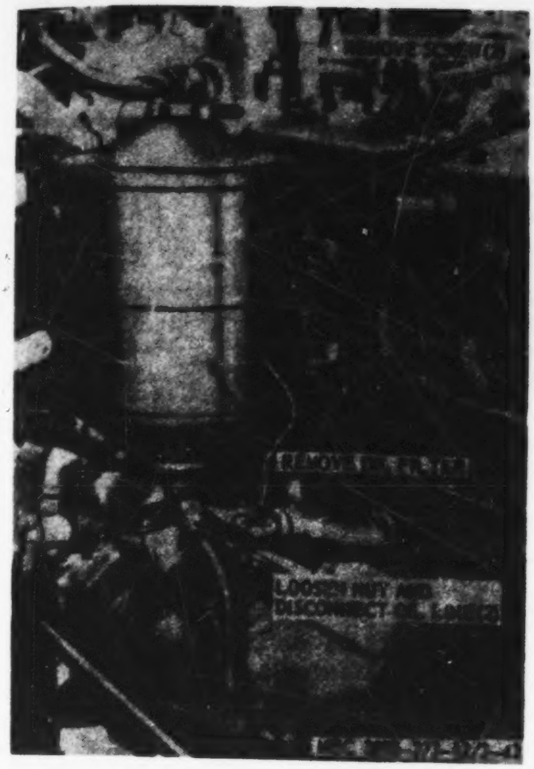


Figure 3-40. Oil filter, removal and installation.

(3) Install the straps (8) on the body (7) and secure with the screws (6), washers (29), and nuts (30).

(4) Position the bracket (33) on the body (7) and secure with the screws (32), washers (28 and 31), and nuts (27).

e. Installation. Install the oil filter, lines, and fittings in reverse of instructions on figure 3-40.

3-73. Engine Oil Pressure Regulator Valve

a. Removal. Remove the oil pressure regulator valve from the engine as instructed on figure 3-42.

b. Cleaning, Inspection, and Repair.

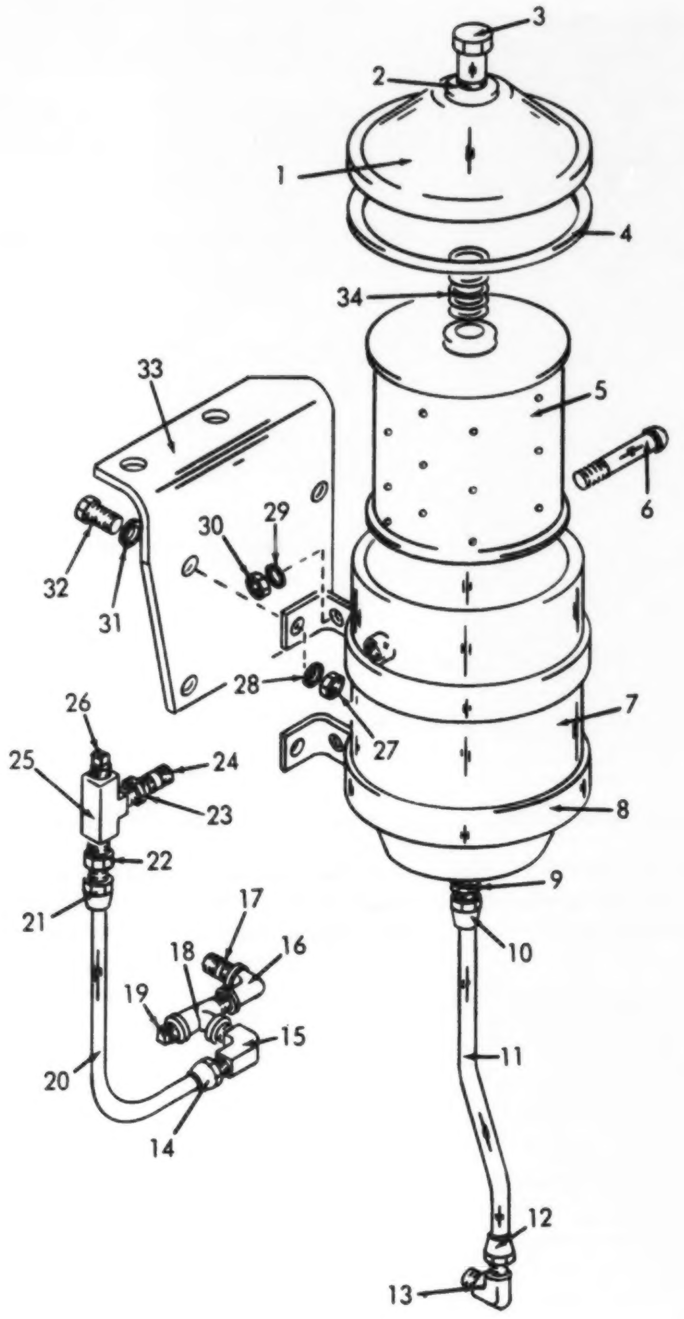
(1) Clean all parts in approved cleaning solvent.

(2) Inspect the valve for damage or evidence of wear where valve sets in block.

(3) Inspect the spring for weak or broken condition. If engine is not badly worn, low engine oil pressure can be caused by a defective spring. Normal oil pressure under load should be 20—30 psi.

(4) Replace defective parts.

c. Installation. Install the oil pressure regulator valve in the engine block in reverse of the instructions on figure 3-42.


3
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MEC 3895-273-12/3-44

1 Cover
2 Gasket
3 Screw
4 Gasket
5 Element
6 Screw
7 Body
8 Strap
9 Connector
10 Nut
11 Tube
12 Nut

Figure 3–41. Oil filter and lines, exploded view.

13 Elbow
14 Nut
15 Elbow
16 Elbow
17 Nipple
18 Tee
19 Plug
20 Tube
21 Nut
22 Connector
23 Bushing
24 Nipple
25 Tee
26 Plug
27 Nut
28 Washer
29 Washer
30 Nut
31 Washer
32 Screw
33 Bracket
34 Spring

Figure 3-41—Continued.

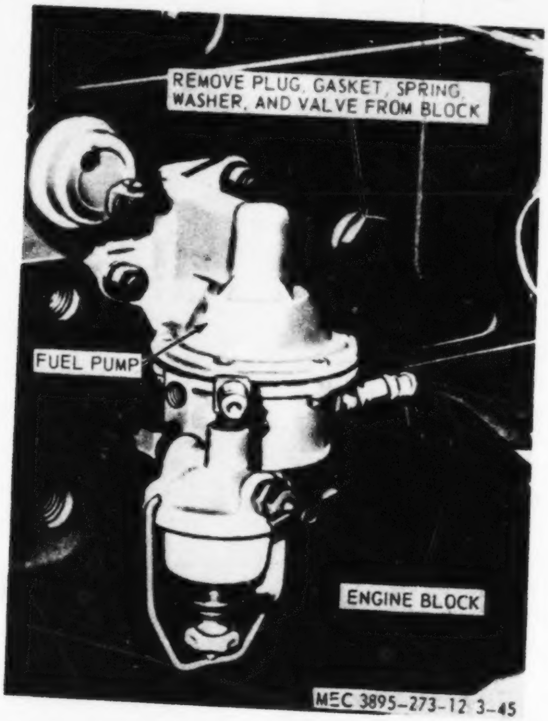


Figure 3-42. Engine oil pressure regulator valve, removal and installation.

Section X. ENGINE COOLING SYSTEM

3-74. Description

The engine cooling system consists of a radiator, water pump, fan, hose, and thermostat. The radiator is protected by a grille and shroud. Coolant is circulated through the system by the water pump, and cooled by the fan as it passes through the radiator core. The thermostat prevents circulation of the coolant until the temperature reaches 160° to 180° F., thus providing a shorter warm-up period for the engine.

3-75. Radiator

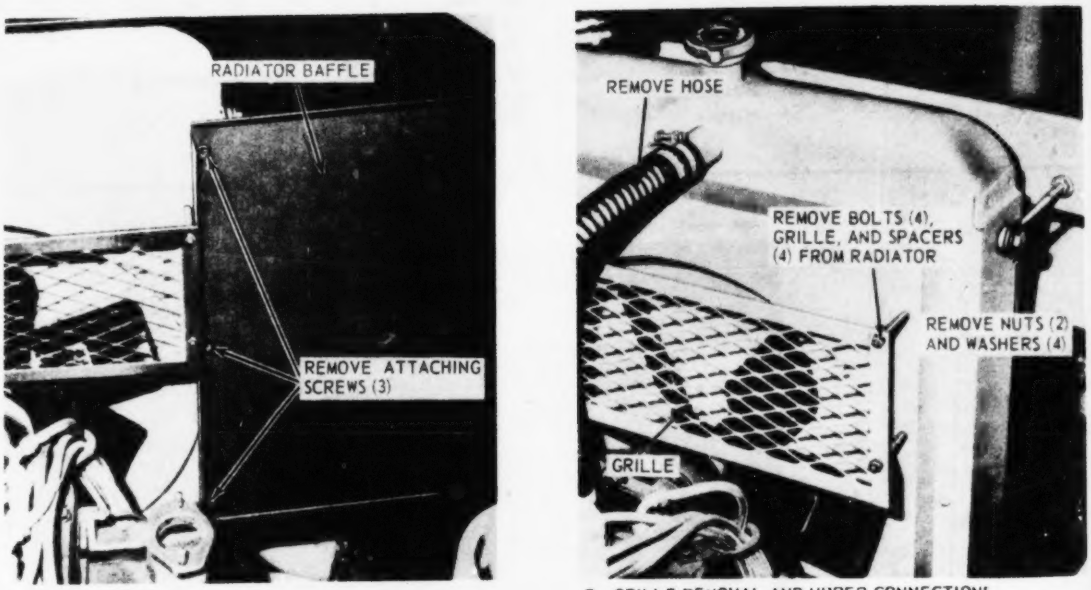
a. Removal. Remove the grille and radiator as instructed on figure 3-43.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

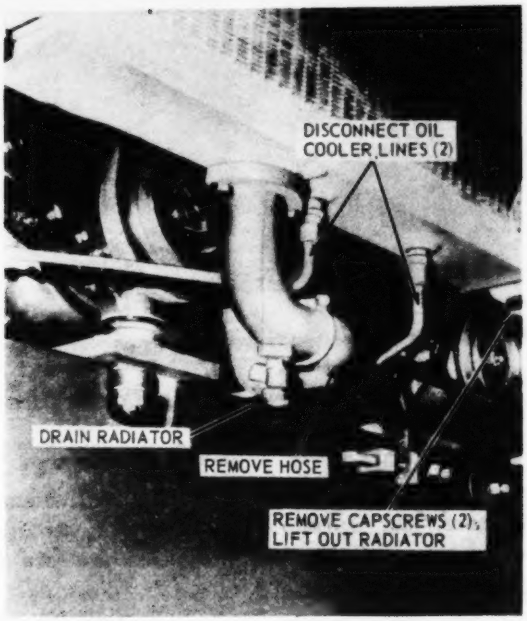
(2) Inspect the radiator for leaks and damage. Replace a leaking or damaged radiator.

c. Installation. Install the radiator and grille in reverse of the instructions on figure 3-43.


RADIATOR BAFFLE
REMOVE ATTACHING SCREWS (3)
REMOVE HOSE
REMOVE BOLTS (4), GRILLE, AND SPACERS (4) FROM RADIATOR
REMOVE NUTS (2) AND WASHERS (4)
GRILLE

A. BAFFLE REMOVAL

B. GRILLE REMOVAL AND UPPER CONNECTIONS


DISCONNECT OIL COOLER LINES (2)
DRAIN RADIATOR
REMOVE HOSE
REMOVE CAPSCREWS (2), LIFT OUT RADIATOR

C. LOWER CONNECTIONS

MEC 3895-272-12/3-43

Figure 3-43. Radiator, removal and installation.

3-76. Fan Belt

a. Removal.

(1) Remove the hydraulic pump drive belt (para 3-112).

(2) Remove the grille (para 3-75).

(3) Remove the fan belt as instructed on figure 3-44.

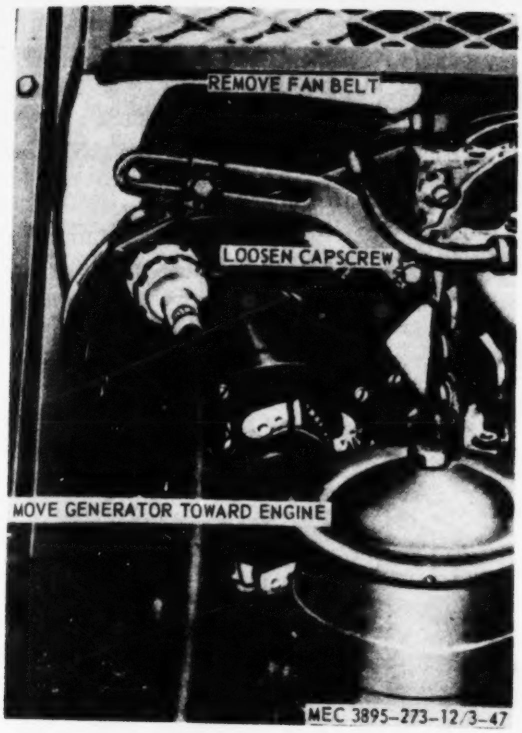


Figure 3-44. Fan belt, removal and installation.

b. Cleaning and Inspection.

(1) Clean the fan belt with an approved cleaning solvent.

(2) Inspect the fan belt for wear, breaks, and fraying. Replace a defective or worn belt.

c. Installation.

(1) Install the fan belt in reverse of the instructions on figure 3-44.

(2) Adjust the fan belt (para 3-13).

(3) Install the hydraulic pump drive belt (para 3-112).

(4) Install the grille (para 3-75).

3-77. Fan Assembly

a. Removal.

(1) Remove the fan belt (para 3-76).

(2) Remove the fan assembly as instructed on figure 3-45.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the fan assembly for bent or broken blades, loose rivets, and other damage.

(3) Straighten blades and tighten loose rivets. Replace a badly damaged fan assembly.

c. Installation.

(1) Install the fan assembly in reverse of the instructions on figure 3-45.

(2) Install the fan belt (para 3-76).

3-78. Water Pump

a. Removal.

(1) Remove the fan assembly (para 3-77).

(2) Remove the water pump as instructed on figure 3-46.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the water pump for leaks, damage, wear, and defects. Replace a leaking or defective pump.

c. Installation.

(1) Install the water pump in reverse of the instructions on figure 3-46.

(2) Install the fan assembly (para 3-77).

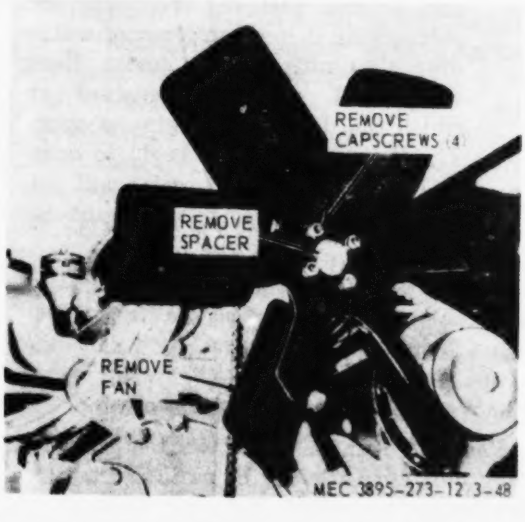


Figure 3-45. Fan assembly, removal and installation.

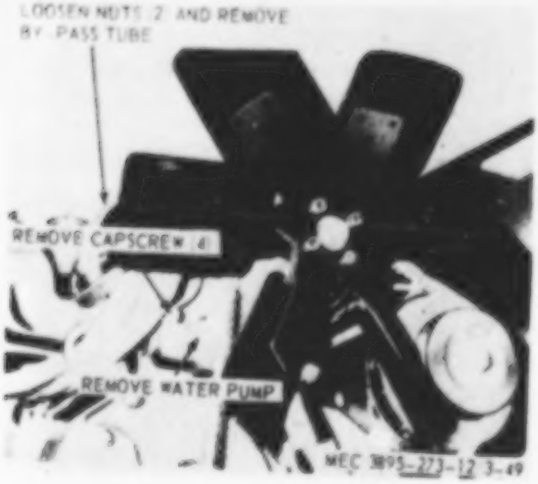

LOOSEN NUTS (2) AND REMOVE BY-PASS TUBE
REMOVE CAPSCREW (4)
REMOVE WATER PUMP
MEC 3895-273-12 3-49

Figure 3-46. Water pump, removal and installation.

3-79. Thermostat and Thermostat Housing

a. Removal. Remove the thermostat and thermostat housing as instructed on figure 3-47.

b. Cleaning, Inspection, and Test.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the housing for cracks and defects. Replace defective housing.

(3) Inspect the thermostat for damage and defects. Test the thermostat by submerging it in a container of water over a suitable heating device. Heat water and check temperature at which the thermostat begins to open. The thermostat should begin to open at 160° F. If the thermostat will not meet these requirements, it must be replaced.

c. Installation. Install the thermostat and thermostat housing in reverse of the instructions on figure 3-47.

3-80. Water Temperature Sending Unit

a. Removal. Remove the water temperature sending unit from the engine as instructed on figure 3-48.

b. Cleaning, Inspection, and Repair.

(1) Clean the water temperature sending unit, removing any scale and rust from the element.

(2) Inspect the unit for damage and proper operation. Replace a defective unit.

c. Installation. Install the water temperature sending unit in the engine in reverse of the instructions on figure 3-48.

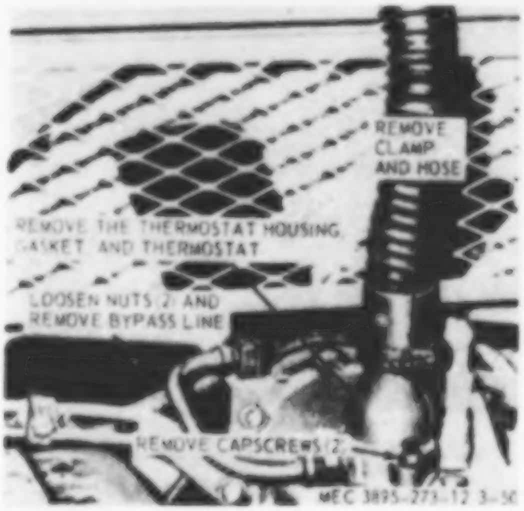

REMOVE CLAMP AND HOSE
REMOVE THE THERMOSTAT HOUSING, GASKET AND THERMOSTAT
LOOSEN NUTS (2) AND REMOVE BYPASS LINE
REMOVE CAPSCREWS (2)
MEC 3895-273-12 3-50

Figure 3-47. Thermostat and thermostat housing, removal and installation.

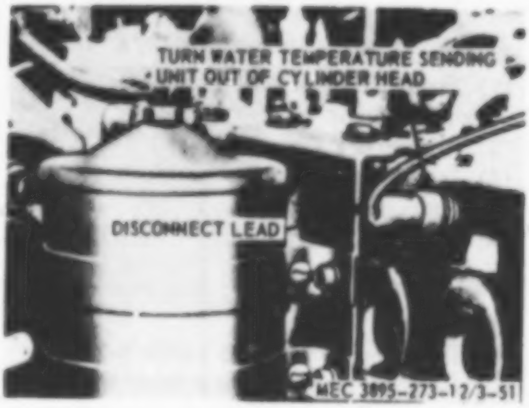

TURN WATER TEMPERATURE SENDING UNIT OUT OF CYLINDER HEAD
DISCONNECT LEAD
MEC 3895-273-12/3-51

Figure 3-48. Water temperature sending unit, removal and installation.

Section XI. ENGINE

3-81. Description

The engine is a Continental, Model FS-244, 6 cylinder, L-head, liquid cooled type. The cylinder head is a flat type mounted on the cylinder block by capscrews. The valves are located in the cylinder block directly under the cylinder head. Covers located under the intake and exhaust manifolds provide access to the valve adjusting mechanism. The intake and exhaust manifolds located on the upper right side of the engine provides for the entry of fuel from the carburetor and expulsion of exhaust gases.

3-82. Cylinder Head

a. Removal.

(1) Drain the radiator (para 3-75).

(2) Disconnect upper radiator hose and by-pass tube (figure 3-47).

(3) Remove oil filter (para 3-72).

(4) Remove overspeed governor (para 3-67).

(5) Remove cylinder head as instructed on figure 3-49.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Clean all traces of old gasket from cylinder head and top of engine block.

(3) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation.

(1) Use a new head gasket and install the cylinder head in reverse of the instructions on figure 3-49.

(2) Tighten the cylinder head in the numbered sequence illustrated in figure 3-50.

Note. Refer to Chapter 1, paragraph 1-4*b*. (8) for correct torquing data for cylinder head attaching hardware.

(3) Install and connect components in reverse order as listed in *a*. (1) through (4) above.

3-83. Manifold Assembly

a. Removal.

(1) Remove the carburetor (para 3-55).

(2) Remove the exhaust pipe (para 3-86).

(3) Remove the manifold assembly as instructed on figure 3-51.

b. Disassembly.

(1) Remove the nuts (3, fig. 3-52), washers (2), and separate the exhaust manifold (1) from the intake manifold (11). Remove the gasket (8).

(2) Remove the valve (21) from the shaft (20).

(3) Observe and mark position of weight (19) on manifold (1). Remove the nut (17), washer (15), and weight assembly (19) from the exhaust manifold (1). Remove the stud (18) and bushings (16) from the manifold (1).

(4) Remove the plugs (10, 12, and 14) from the intake manifold (11).

(5) Remove the studs (9 and 13) from the intake manifold (11).

c. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Replace worn, defective, or damaged parts.

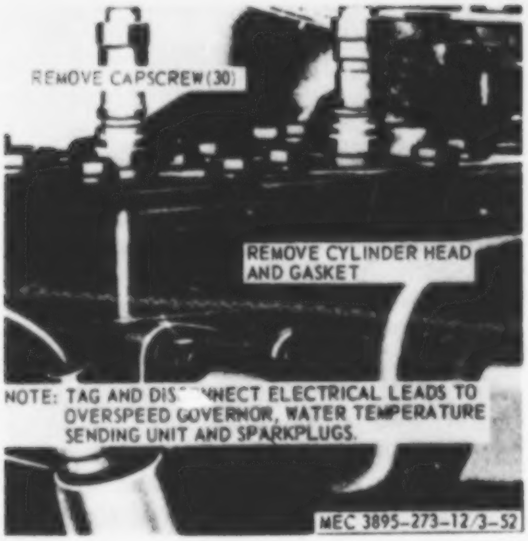
d. Reassembly.

(1) Install the studs (9 and 13) and plugs (10, 12, and 14) in the intake manifold (11).

(2) Install the stud (18) and bushings (16) in the exhaust manifold (1).

(3) Install the valve (21), weight and shaft assembly (19, 20), washer (15), and nut (17) on the exhaust manifold (1). Place weight in the position from which removed from manifold. Tighten nut (17).

(4) Place a new gasket (8) over the studs (4) and position the exhaust



NOTE: TAG AND DISCONNECT ELECTRICAL LEADS TO OVERSPEED GOVERNOR, WATER TEMPERATURE SENDING UNIT AND SPARKPLUGS.

Figure 3-49. Cylinder head, removal and installation.

manifold (1) on the intake manifold (11), secure with the washers (2) and nuts (3).

e. Installation.

(1) Install the manifold assembly in reverse of the instructions on figure 3-51.

(2) Install the carburetor (para 3-55).

(3) Install the exhaust pipe (para 3-86).

3-84. Valves

a. Remove the valve cover as instructed on figure 3-53.

b. Adjust the valves as instructed on figure 3-54.

c. Install the valve cover in reverse of the instructions on figure 3-53.

3-85. Muffler

a. Removal. Remove the muffler as instructed on figure 3-55.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the muffler for defects and leaks. Replace a defective or leaking muffler.

c. Installation. Install the muffler in reverse of the instructions on figure 3-55.

3-86. Exhaust Pipe

a. Removal.

(1) Remove the muffler (para 3-85).

(2) Remove the exhaust pipe as instructed on figure 3-56.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the exhaust pipe for holes, rust, and other damage. Replace a defective exhaust pipe.

c. Installation.

(1) Install the exhaust pipe in reverse of the instructions on figure 3-56.

(2) Install the muffler (para 3-85).

3-87. Crankshaft Pulley

a. Removal.

(1) Remove six (6) nuts and lockwashers that secure the front dust shield to frame. Remove shield from frame. Dust shield is located immediately behind the guide roll.

(2) Remove the drive and hydraulic pump belts (paras 3-76 and 3-112).

(3) Remove the crankshaft pulley as instructed on figure 3-57.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

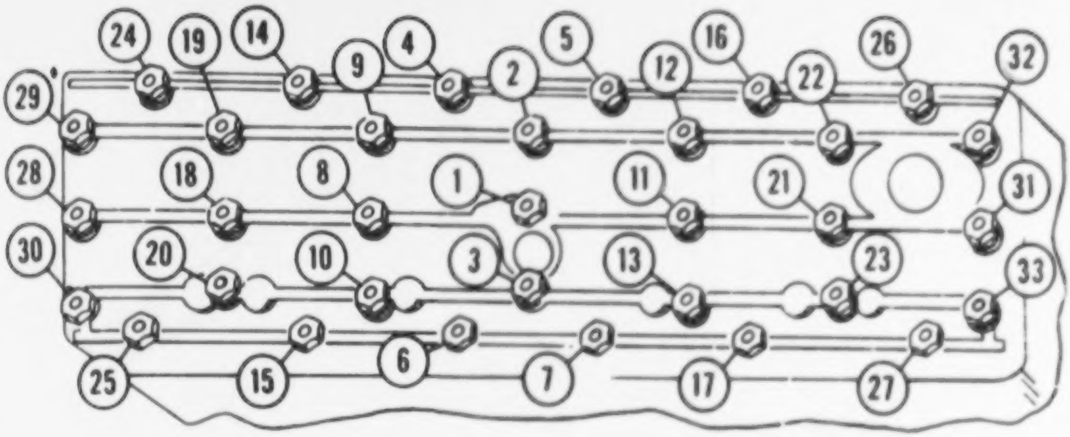
(2) Inspect all parts for wear, defects, and damage. Replace worn, defective, or damaged parts.

c. Installation.

(1) Install the crankshaft pulley in reverse of the instructions on figure 3-57.

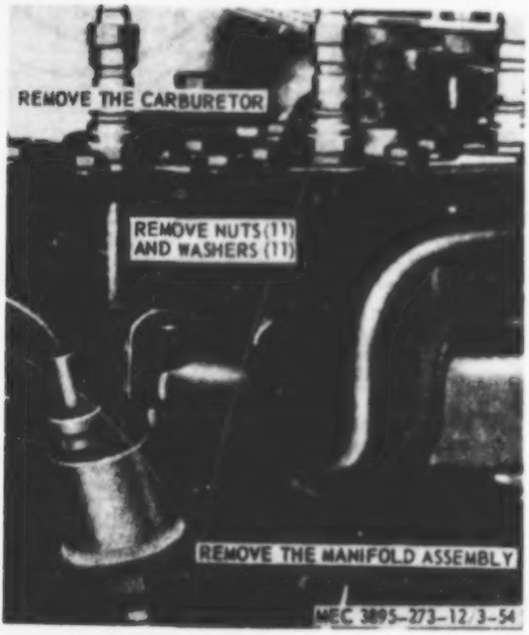
(2) Install the drive and hydraulic pump belts (paras 3-76 and 3-112).

(3) Secure the dust shield to the frame with six (6) nuts and lockwashers.


24
19
14
4
5
16
26
32
9
2
12
22
29
28
18
8
1
11
21
31
30
20
10
3
13
23
33
25
15
6
7
17
27

EMC 2805-210-12/33

Figure 3-50. Cylinder head tightening sequence.

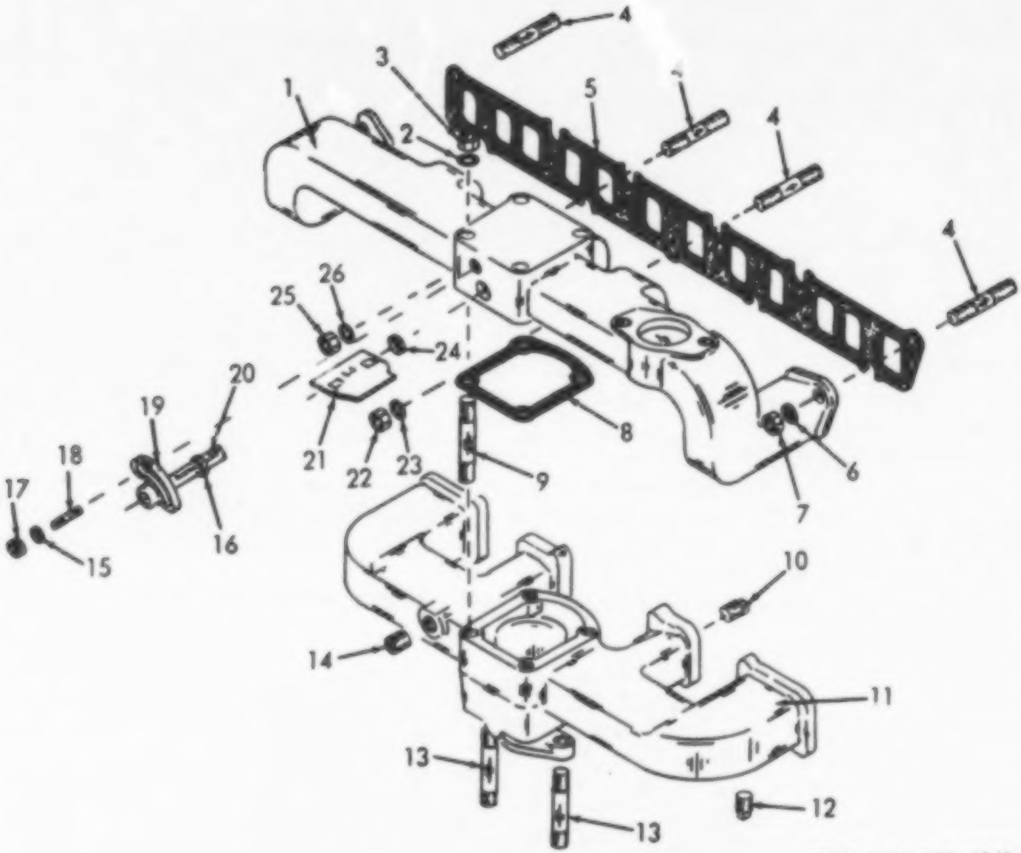

REMOVE THE CARBURETOR

REMOVE NUTS(11)
AND WASHERS (11)

REMOVE THE MANIFOLD ASSEMBLY

MEC 3895-273-12/3-54

Figure 3-51. Manifold assembly, removal and installation.


4
3
1
5
4
2
4
4
26
25
24
20
19
8
18
21
22
23
9
6
17
7
16
15
10
14
11
13
12
13

MEC 3895-273-12/3-55

1	Exhaust manifold	8	Gasket	15	Washer	22	Nut
2	Washer	9	Stud	16	Bushing	23	Washer
3	Nut	10	Plug	17	Nut	24	Washer
4	Stud	11	Intake Manifold	18	Stud	25	Nut
5	Gasket	12	Plug	19	Weight	26	Washer
6	Washer	13	Stud	20	Shaft		
7	Nut	14	Plug	21	Valve		

Figure 3-52. Manifold assembly, exploded view.

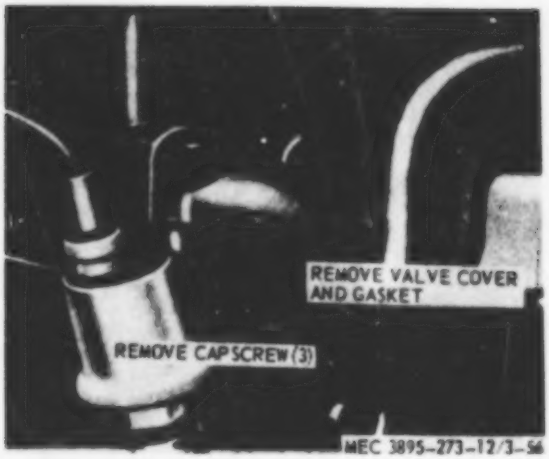
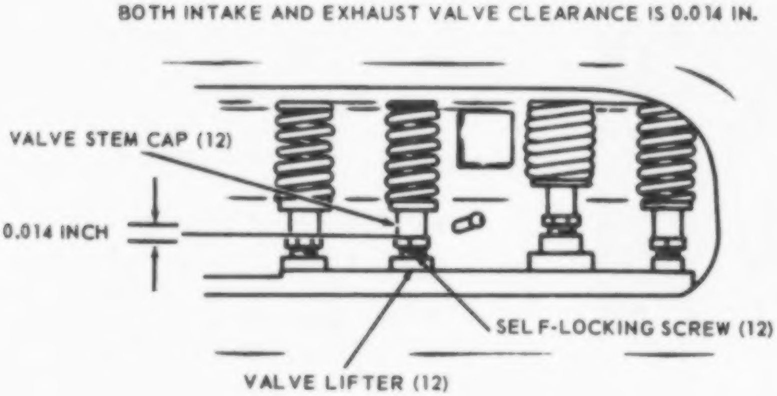

REMOVE VALVE COVER AND GASKET
REMOVE CAPSCREW (3)
MEC 3895-273-12/3-56

Figure 3-53. Valve cover, removal and installation.


BOTH INTAKE AND EXHAUST VALVE CLEARANCE IS 0.014 IN.
VALVE STEM CAP (12)
0.014 INCH
SELF-LOCKING SCREW (12)
VALVE LIFTER (12)

MEC 3895-273-12/3-57

Figure 3-54. Valve adjustment.

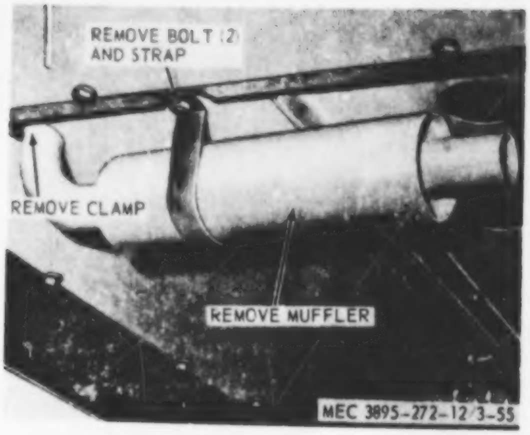

REMOVE BOLT (2) AND STRAP
REMOVE CLAMP
REMOVE MUFFLER
MEC 3895-272-12/3-55

Figure 3-55. Muffler, removal and installation.

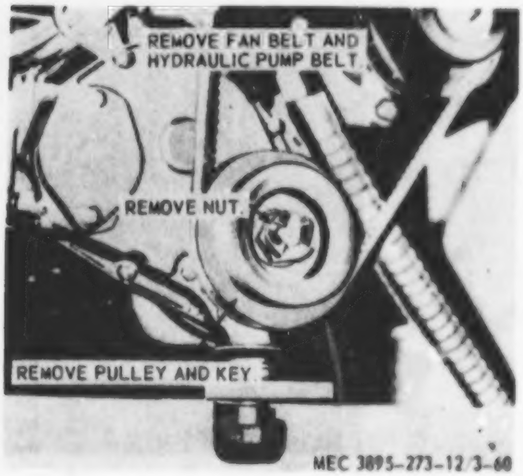

REMOVE FAN BELT AND HYDRAULIC PUMP BELT
REMOVE NUT
REMOVE PULLEY AND KEY
MEC 3895-273-12/3-60

Figure 3-57. Crankshaft pulley, removal and installation.

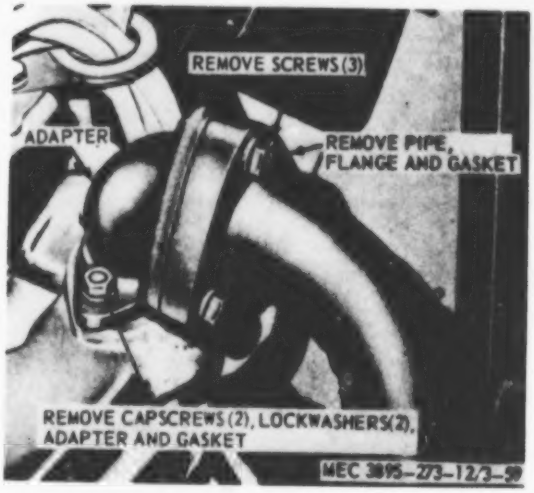

REMOVE SCREWS (3)
ADAPTER
REMOVE PIPE, FLANGE AND GASKET
REMOVE CAPSCREWS (2), LOCKWASHERS (2), ADAPTER AND GASKET
MEC 3895-273-12/3-59

Figure 3-56. Exhaust pipe, removal and installation.

Section XII. CONTROLS AND INSTRUMENTS

3-88. Description

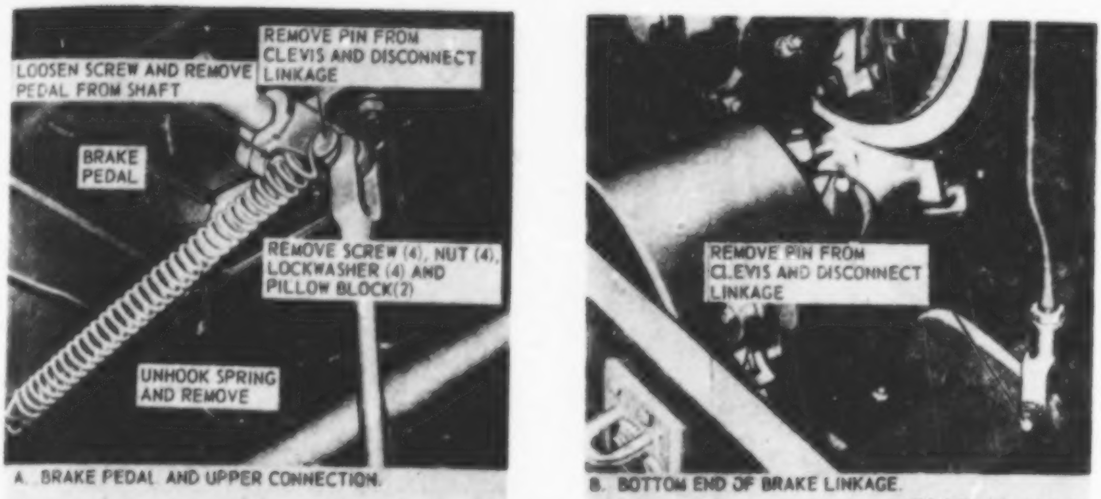
The operating controls of the roller consists of the steering lever, forward and reverse clutch lever, gear shift lever, hand brake lever, foot brake pedal, sprinkler pedals and related linkage. All the controls are located on the operator's platform and connected to the related component by linkage or cables. The instruments and gages are located on the instrument panel along side the operator.

3-89. Service Brake Pedal and Linkage

a. Removal. Remove the foot brake pedal and linkage as instructed on figure 3-58.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.


REMOVE PIN FROM CLEVIS AND DISCONNECT LINKAGE
LOOSEN SCREW AND REMOVE PEDAL FROM SHAFT
BRAKE PEDAL
REMOVE SCREW (4), NUT (4), LOCKWASHER (4) AND PILLOW BLOCK(2)
UNHOOK SPRING AND REMOVE
REMOVE PIN FROM CLEVIS AND DISCONNECT LINKAGE

A. BRAKE PEDAL AND UPPER CONNECTION.

B. BOTTOM END OF BRAKE LINKAGE.

MEC 3895-272-12/3-58

Figure 3-58. Service brake pedal and linkage, removal and installation.

(2) Inspect all parts for wear, damage, and defects. Replace worn, damaged, or defective parts.

c. Installation.

(1) Install the service brake pedal and linkage in reverse of the instructions on figure 3-58.

(2) Adjust the service brake (para 3-15).

3-90. Parking Brake Lever and Linkage

a. Removal. Remove the parking brake lever and linkage as instructed on figure 3-59.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, damage, and defects. Replace worn or damaged parts.

c. Installation.

(1) Install the parking brake lever and linkage in reverse of the instructions on figure 3-59.

(2) Adjust the parking brake (para 3-16).

3-91. Gearshift Lever and Linkage

a. Removal. Remove the gearshift lever and linkage as instructed on figure 3-60.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Replace worn, defective, or damaged parts.

c. Installation. Install the gearshift lever and linkage in reverse of the instructions on figure 3-60.

3-92. Forward and Reverse Clutch Lever and Linkage

a. Removal. Remove the forward and reverse clutch lever and linkage as instructed on figure 3-60.

b. Cleaning, Inspection, and Repair.

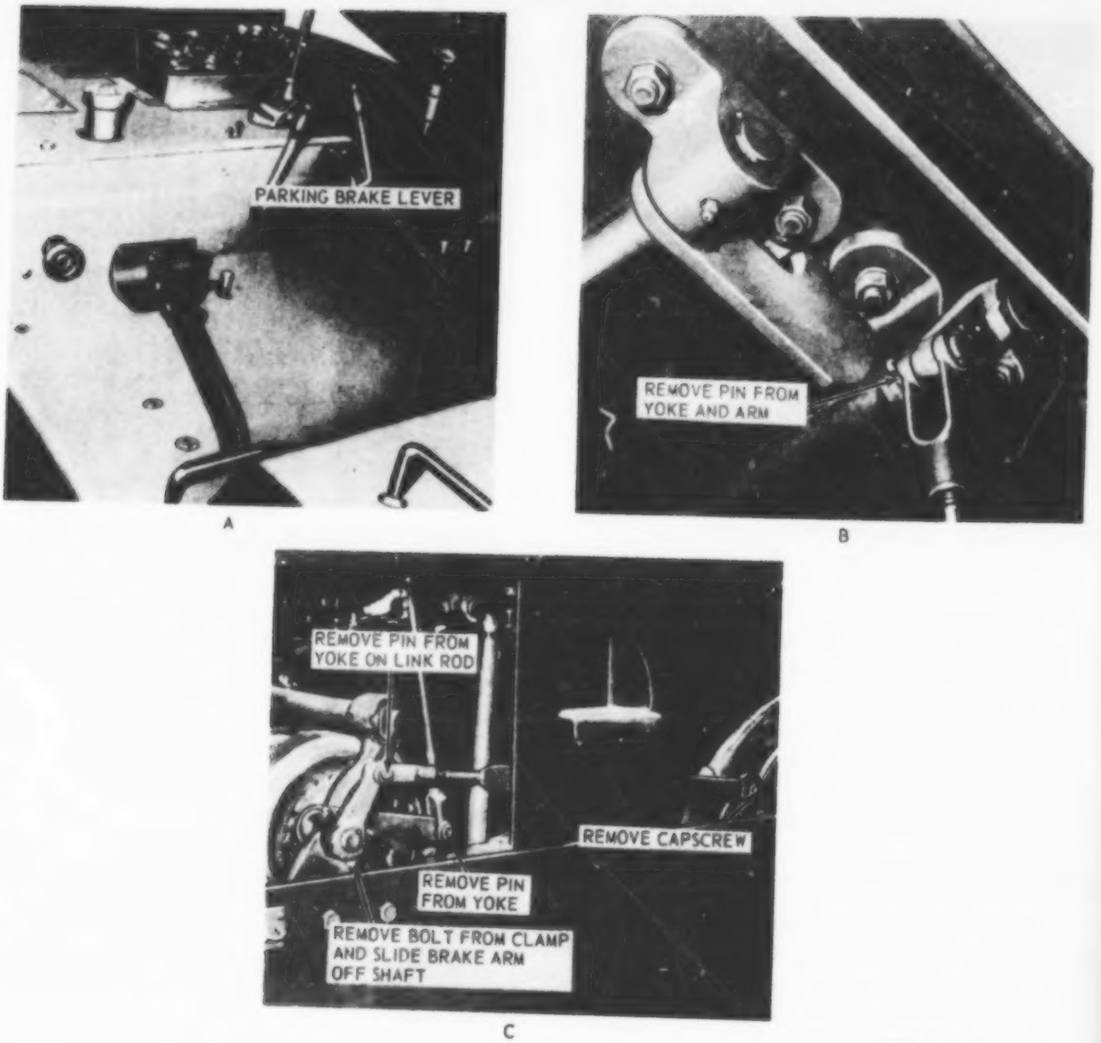
(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Repair or replace worn, defective, or damaged parts.

c. Installation. Install the forward and reverse clutch lever in reverse of the instructions on figure 3-60.

3-93. Steering Valve Lever and Linkage

a. Removal. Remove the steering valve lever, and linkage as instructed on figure 3-61.


PARKING BRAKE LEVER
A
REMOVE PIN FROM YOKE AND ARM
B
REMOVE PIN FROM YOKE ON LINK ROD
REMOVE CAPSCREW
REMOVE PIN FROM YOKE
REMOVE BOLT FROM CLAMP AND SLIDE BRAKE ARM OFF SHAFT
C

MEC 3895–272–12 3–59

Figure 3–59. Parking brake lever and linkage, removal and installation.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Repair or replace worn, defective or damaged parts.

c. Installation. Install the steering valve lever and linkage in reverse of the instructions on figure 3–61.

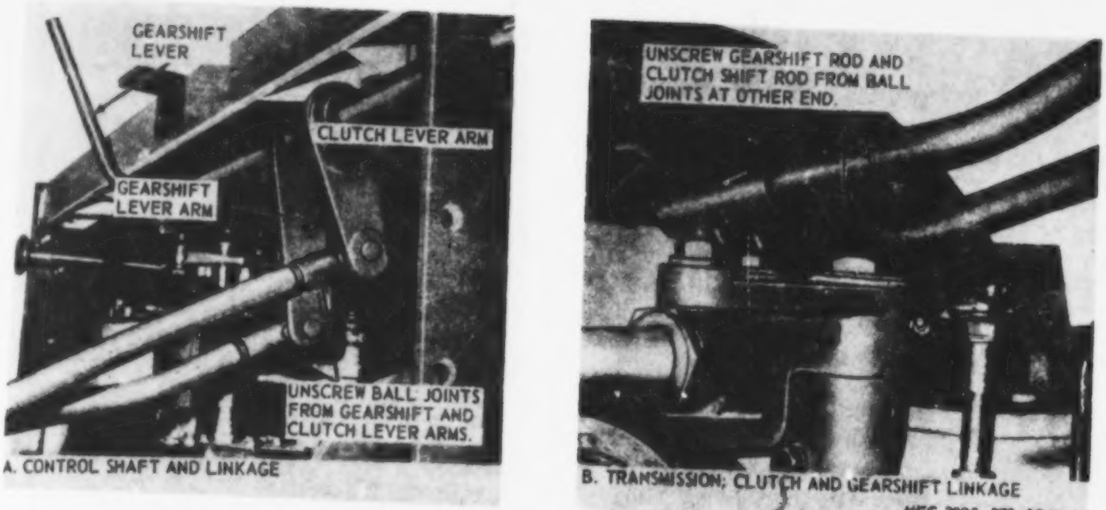
3–94. Throttle Lever and Linkage

a. Removal. Remove the throttle lever and linkage as instructed on figure 3–62.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects,

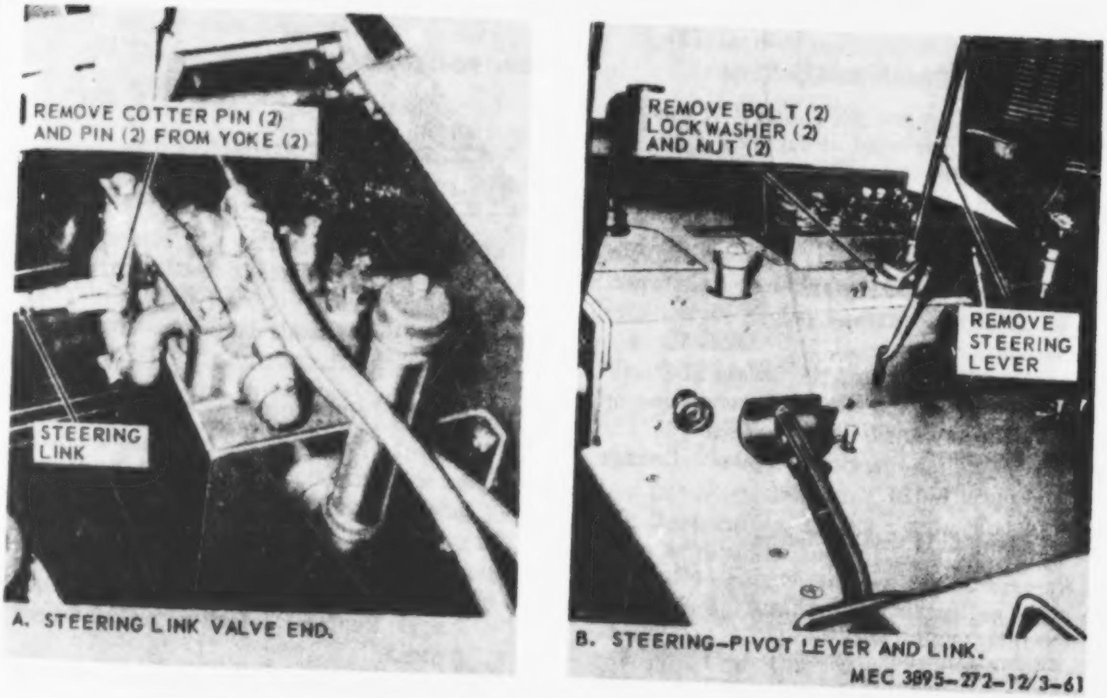

GEARSHIFT LEVER
CLUTCH LEVER ARM
GEARSHIFT LEVER ARM
UNSCREW BALL JOINTS FROM GEARSHIFT AND CLUTCH LEVER ARMS.
UNSCREW GEARSHIFT ROD AND CLUTCH SHIFT ROD FROM BALL JOINTS AT OTHER END.

A. CONTROL SHAFT AND LINKAGE

B. TRANSMISSION; CLUTCH AND GEARSHIFT LINKAGE

MEC 3895-272-12/3-60

Figure 3-60. Gearshift and clutch levers and linkage, removal and installation.


REMOVE COTTER PIN (2) AND PIN (2) FROM YOKE (2)
STEERING LINK
REMOVE BOLT (2) LOCKWASHER (2) AND NUT (2)
REMOVE STEERING LEVER

A. STEERING LINK VALVE END.

B. STEERING-PIVOT LEVER AND LINK.

MEC 3895-272-12/3-61

Figure 3-61. Steering valve lever and linkage, removal and installation.

and damage. Repair or replace worn, defective, or damaged parts.

c. *Installation.*

(1) Install the throttle lever and linkage in reverse of the instructions on figure 3-62.

(2) Adjust the throttle linkage (para 3-58).

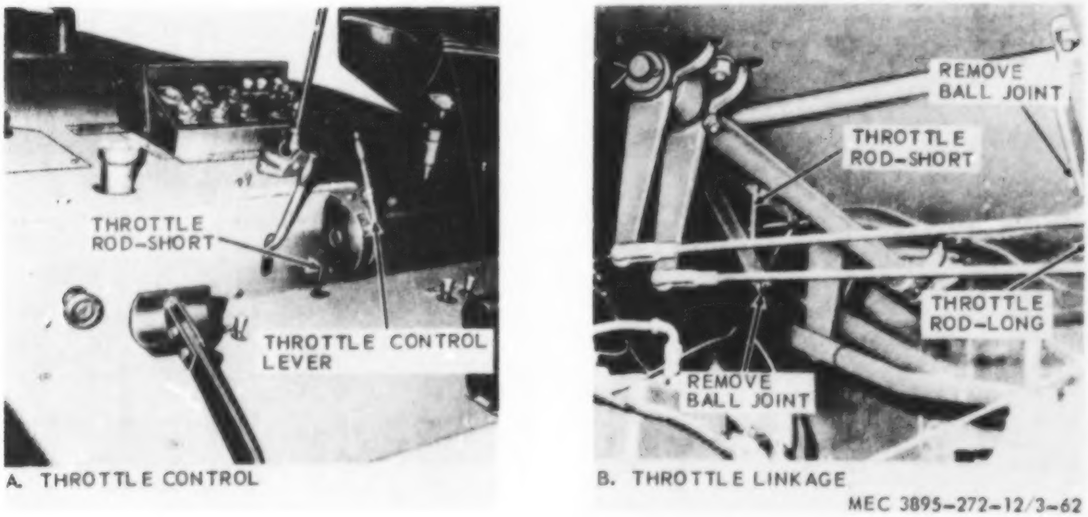


Figure 3-62. Throttle lever and linkage, removal and installation.

3-95. Sprinkler Pedals and Linkage

a. Removal. Remove the sprinkler pedals and linkage as instructed on figure 3-63.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Repair or replace worn, defective, or damaged parts.

c. Installation.

(1) Install the sprinkler pedals and linkage in reverse of the instructions on figure 3-63.

(2) Adjust the sprinkler pedal linkage (para 3-18).

3-96. Engine Oil Pressure Gage

a. Removal. Remove the engine oil pressure gage as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the engine oil pressure gage in reverse of the instructions on figure 3-64.

3-97. Fuel Level Gage

a. Removal. Remove the fuel level gage as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the fuel level gage in reverse of the instructions on figure 3-64.

3-98. Engine Temperature Gage

a. Removal. Remove the engine temperature gage as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the engine temperature gage in reverse of the instructions on figure 3-64.

3-99. Battery Indicator Gage

a. Removal. Remove the battery indicator gage as instructed on figure 3-64.

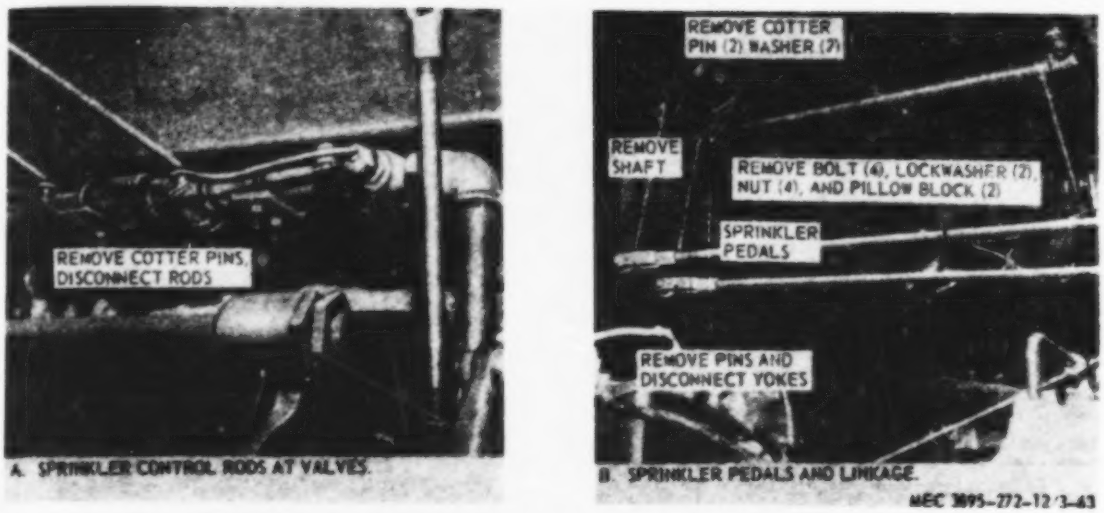

REMOVE COTTER PINS, DISCONNECT RODS
A. SPRINKLER CONTROL RODS AT VALVES.
REMOVE COTTER PIN (2) WASHER (2)
REMOVE SHAFT
REMOVE BOLT (4), LOCKWASHER (2), NUT (4), AND PILLOW BLOCK (2)
SPRINKLER PEDALS
REMOVE PINS AND DISCONNECT YOKES
B. SPRINKLER PEDALS AND LINKAGE.
MEC 3895-272-12/3-63

Figure 3-63. Sprinkler pedals and linkage, removal and installation.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for damage. Replace defective or damaged parts.

c. Installation. Install the battery indicator gage in reverse of the instructions on figure 3-64.

3-100. Converter Oil Pressure Gage

a. Removal. Remove the converter oil pressure gage as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the converter oil pressure gage in reverse of the instructions on figure 3-64.

3-101. Converter Oil Temperature Gage

a. Removal. Remove the converter oil temperature gage as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the converter oil temperature gage in reverse of the instructions on figure 3-64.

3-102. Hour Meter

a. Removal. Remove the hour meter as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the hour meter in reverse of the instructions on figure 3-64.

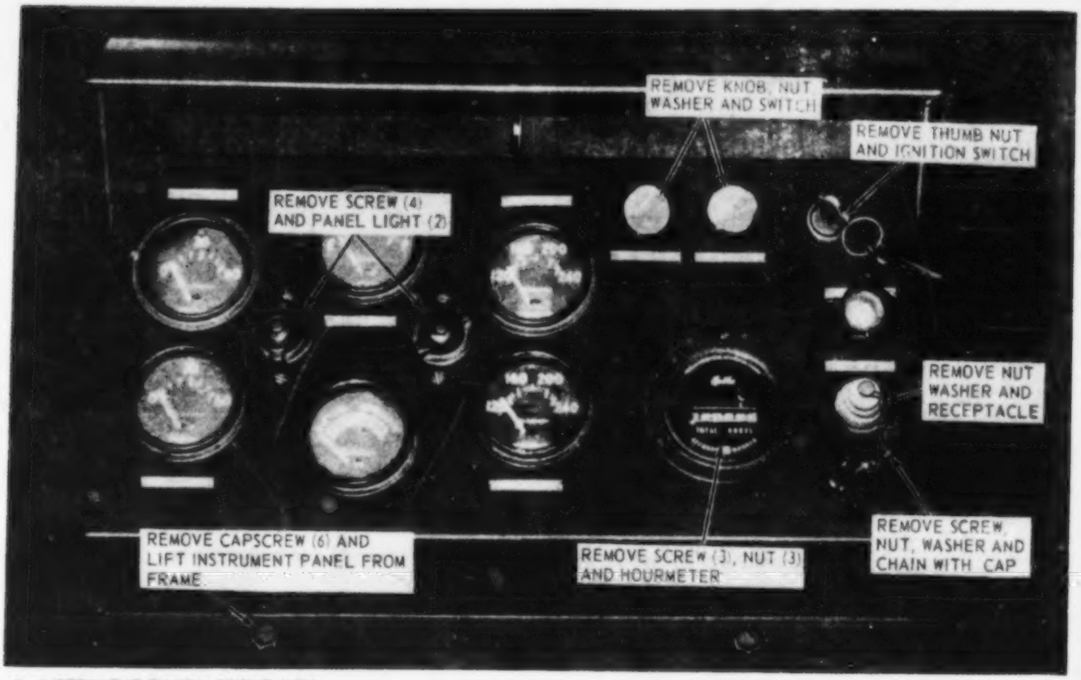
3-103. Instrument Panel Light

a. Removal. Remove the instrument panel light as instructed on figure 3-64.

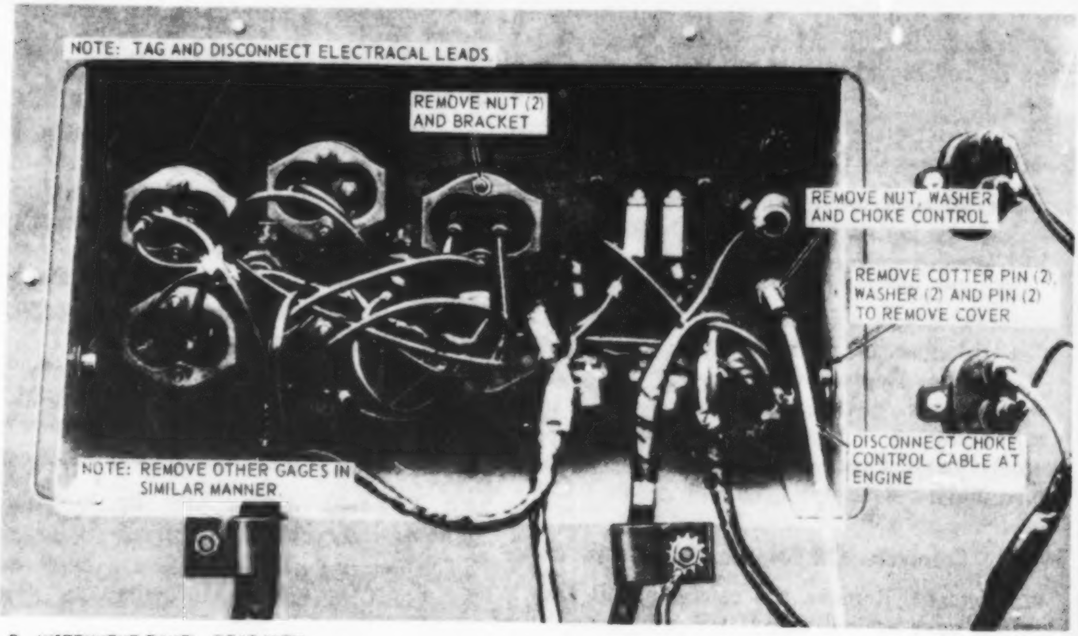
b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.


REMOVE KNOB, NUT WASHER AND SWITCH
REMOVE THUMB NUT AND IGNITION SWITCH
REMOVE SCREW (4) AND PANEL LIGHT (2)
REMOVE NUT WASHER AND RECEPTACLE
REMOVE SCREW, NUT, WASHER AND CHAIN WITH CAP
REMOVE CAPSCREW (6) AND LIFT INSTRUMENT PANEL FROM FRAME
REMOVE SCREW (3), NUT (3) AND HOURMETER

A. INSTRUMENT PANEL, FRONT VIEW.


NOTE: TAG AND DISCONNECT ELECTRACAL LEADS
REMOVE NUT (2) AND BRACKET
REMOVE NUT, WASHER AND CHOKE CONTROL
REMOVE COTTER PIN (2), WASHER (2) AND PIN (2) TO REMOVE COVER
DISCONNECT CHOKE CONTROL CABLE AT ENGINE
NOTE: REMOVE OTHER GAGES IN SIMILAR MANNER

B. INSTRUMENT PANEL, REAR VIEW.

MEC 3895-272-12 3-64

Figure 3-64. Instrument panel and instruments, removal and installation.

c. Installation. Install the instrument panel light in reverse of the instructions on figure 3-64.

3-104. Torque Converter Oil Pressure Sending Unit

a. Removal. Remove the torque converter oil pressure sending unit as instructed on figure 3-65.

b. Cleaning, Inspection, and Repair.

(1) Clean the sending unit with a cloth and cleaning solvent.

(2) Inspect the unit for damage. Check it for proper operation. Replace a defective sending unit.

c. Installation. Install the converter oil pressure sending unit in reverse of instructions on figure 3-65.

3-105. Engine Oil Pressure Sending Unit

a. Removal. Remove the engine oil pressure sending unit as instructed on figure 3-66.

b. Cleaning, Inspection, and Repair.

(1) Clean the engine oil pressure sending unit with a cloth and approved cleaning solvent.

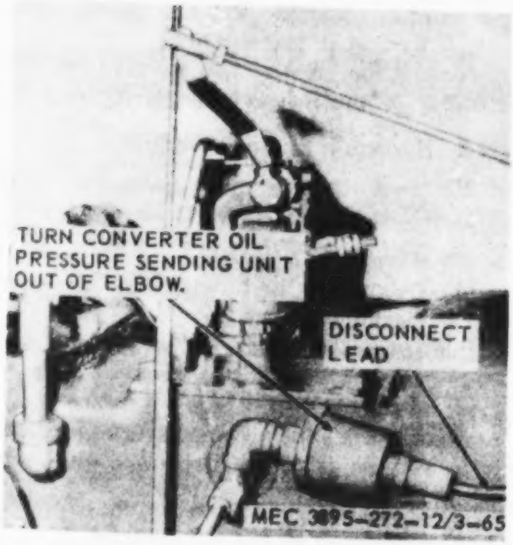


Figure 3-65. Torque converter oil pressure sending unit, removal and installation.

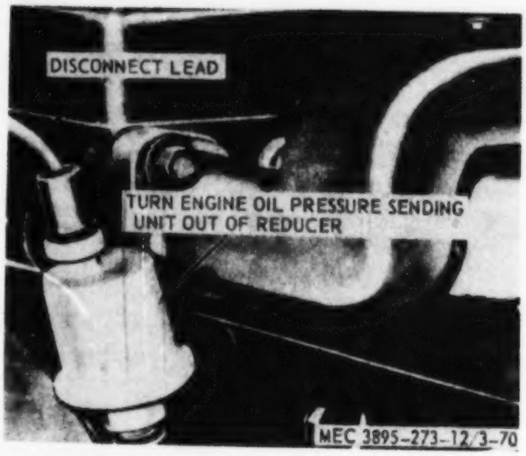


Figure 3-66. Engine oil pressure sending unit, removal and disassembly.

(2) Inspect the unit for damage and for proper operation. Replace a defective unit.

c. Installation. Install the engine oil pressure sending unit in reverse of the instructions on figure 3-66.

3-106. Torque Converter Oil Temperature Sending Unit

a. Removal. Remove the torque converter oil temperature sending unit as instructed on figure 3-67.

b. Cleaning, Inspection, and Repair.

(1) Clean the converter oil temperature sending unit with a cloth and approved cleaning solvent.

(2) Inspect the unit for damage. Check for proper operation. Replace a defective unit.

c. Installation. Install the converter oil temperature sending unit in reverse of the instructions on figure 3-67.

3-107. Floodlamp Switches

a. Removal. Remove the floodlamp switches as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

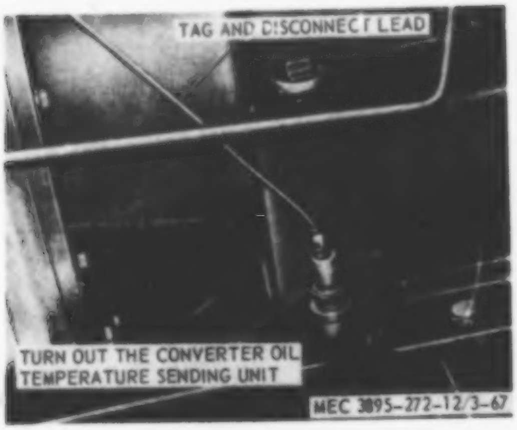


Figure 3-67. Torque converter oil temperature sending unit, removal and installation.

(2) Inspect all parts for defects and damage. Check switch continuity in the on position. Replace defective, damaged, or inoperative parts.

c. Installation. Install floodlamp switches in reverse of the instructions on figure 3-64.

3-108. Ignition Switch

a. Removal. Remove the ignition switch as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Inspect the switch for proper operation. Replace defective, damaged, or inoperative parts.

c. Installation. Install the ignition switch in reverse of the instructions on figure 3-64.

3-109. Trouble Light Receptacle

a. Removal. Remove the trouble light receptacle as instructed on figure 3-64.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the trouble light receptacle in reverse of the instructions on figure 3-64.

Section XIII. HYDRAULIC SYSTEM

–110. Description

he hydraulic system consists of a hydraulic pump, cylinders, hydraulic filter, control valve, relief valve, hydraulic reservoir, lines, and fittings. The hydraulic cylinder is actuated by oil under pressure controlled by the control valve. Relief valve opens when the cylinder reaches the full limit of travel and the oil is by-passed to the oil reservoir.

Note. Prompt and firm response in the hydraulic steering system is possible only when the system is free from air. Sluggish and spongy response can be caused by air in the system. Remove by opening the line at the highest point and operating the cylinder to remove the air from the lines.

3-111. Steering Cylinder

a. Removal. Remove the steering cylinder as instructed on figur[illegible]

b. Cleaning, Insp[illegible]*ir.*

(1) Clean all par[illegible] approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Replace worn, defective, or damaged parts.

c. Installation. Install the steering cylinder in reverse of the instructions on figure 3-68.

3-112. Hydraulic Pump Drive Belt

a. Removal. Remove the hydraulic pump belt as instructed on figure 3-69.

b. Cleaning and Inspection.

(1) Clean the belt with an approved cleaning solvent.

(2) Inspect the belt for wear, cuts, and fraying. Replace a badly worn or damaged belt.

c. Installation. Install the hydraulic pump belt in reverse of the instructions on figure 3-69.

3-113. Hydraulic Pump

a. Removal. Remove the hydraulic pump as instructed on Figure 3-70.

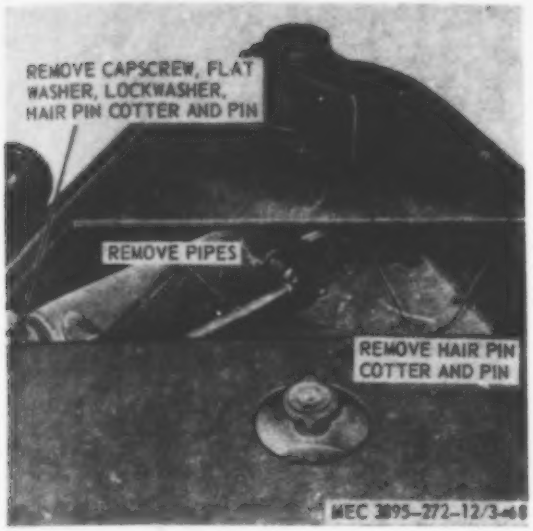

REMOVE CAPSCREW, FLAT WASHER, LOCKWASHER, HAIR PIN COTTER AND PIN
REMOVE PIPES
REMOVE HAIR PIN COTTER AND PIN
MEC 3895-272-12/3-68

Figure 3-68. Steering cylinder, removal and installation.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the pump for damage and proper operation. Replace a damaged or inoperative pump.

c. Installation. Install the hydraulic pump in reverse of the instructions on figure 3-70.

3-114. Steering Control and Pressure Regulating Valve

a. Removal.

(1) Disconnect the control lever linkage from the control valve (para 3-93).

(2) Remove the steering control and regulating valve assembly as instructed on figure 3-71.

b. Cleaning, Inspection, and Repair.

(1) Clean the control valve in approved cleaning solvent.

(2) Inspect the valve for damage, cracked housing, loose fit of plungers in housing, and other defects. Check spring for cracking, weakness, or other defects.

(3) Inspect the plunger and ball for pitting, cracking, grooving, or other damage. Replace defective parts.

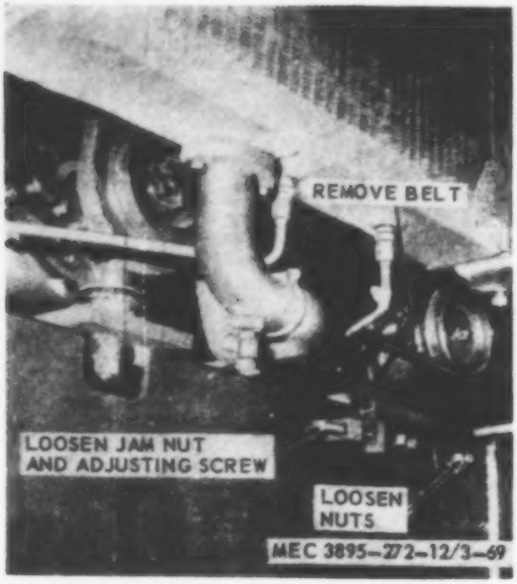

REMOVE BELT
LOOSEN JAM NUT AND ADJUSTING SCREW
LOOSEN NUTS
MEC 3895-272-12/3-69

Figure 3-69. Hydraulic pump belt, removal and installation.

c. Installation.

(1) Install the steering control and regulating valve assembly in reverse of the instructions on figure 3-71.

(2) Connect the control lever linkage to the valve (para 3-93).

d. Adjustment. Adjust the pressure regulator valve as instructed on figure 3-71.

3-115. Hydraulic Tank, Lines, and Fittings

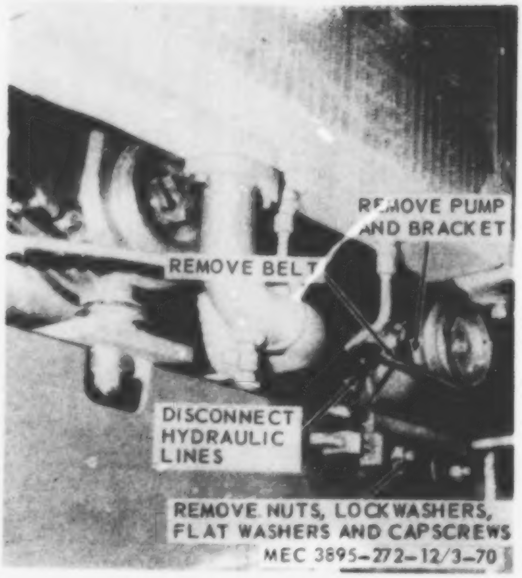
a. Removal. Remove the hydraulic tank, lines, and fittings as instructed on figure 3-72.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for defects and damage. Replace defective or damaged parts.

c. Installation. Install the hydraulic tank, lines and fittings in reverse of the instructions on figure 3-72. Refer to figure 3-73 for piping diagram.



REMOVE PUMP AND BRACKET

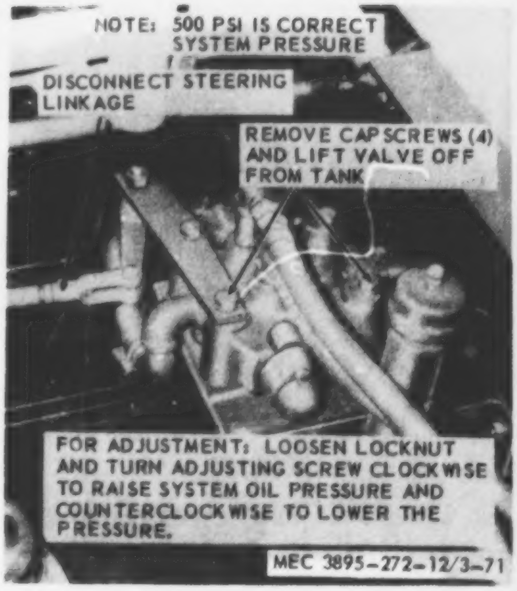
REMOVE BELT

DISCONNECT HYDRAULIC LINES

REMOVE NUTS, LOCKWASHERS, FLAT WASHERS AND CAPSCREWS

MEC 3895-272-12/3-70

Figure 3-70. Hydraulic pump, removal and installation.



NOTE: 500 PSI IS CORRECT SYSTEM PRESSURE

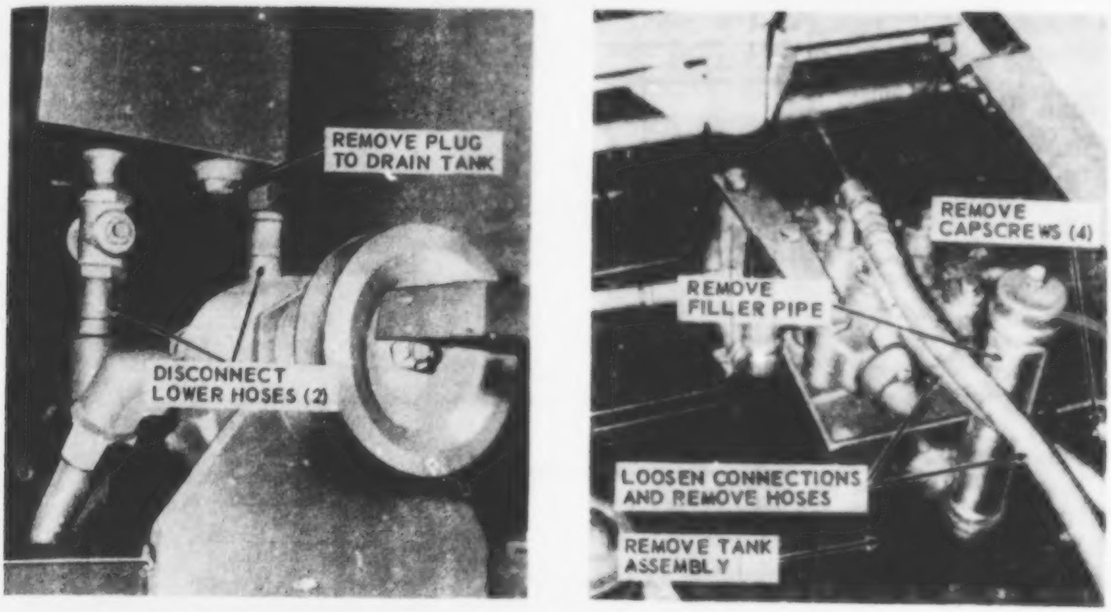
DISCONNECT STEERING LINKAGE

REMOVE CAPSCREWS (4) AND LIFT VALVE OFF FROM TANK

FOR ADJUSTMENT: LOOSEN LOCKNUT AND TURN ADJUSTING SCREW CLOCKWISE TO RAISE SYSTEM OIL PRESSURE AND COUNTERCLOCKWISE TO LOWER THE PRESSURE.

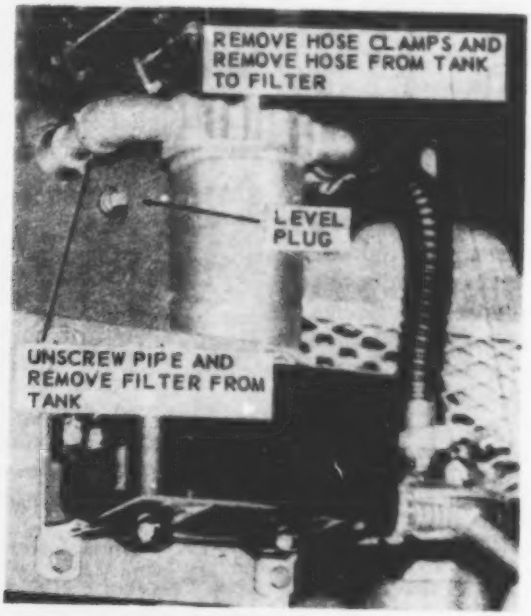
MEC 3895-272-12/3-71

Figure 3-71. Steering control and regulating valve, removal and installation.


REMOVE PLUG TO DRAIN TANK
DISCONNECT LOWER HOSES (2)
REMOVE CAPSCREWS (4)
REMOVE FILLER PIPE
LOOSEN CONNECTIONS AND REMOVE HOSES
REMOVE TANK ASSEMBLY

A. HYDRAULIC TANK DRAIN AND LOWER CONNECTIONS

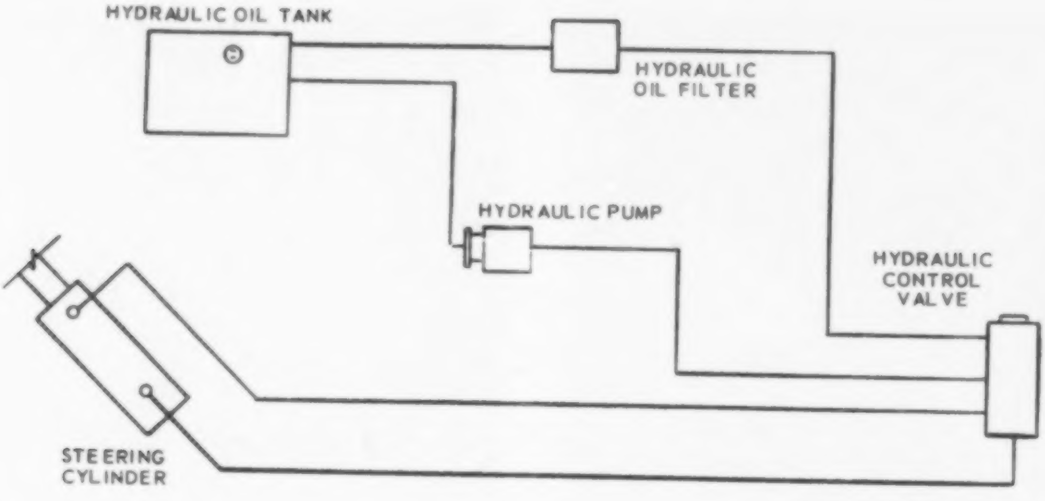
B. HYDRAULIC TANK AND LINES


REMOVE HOSE CLAMPS AND REMOVE HOSE FROM TANK TO FILTER
LEVEL PLUG
UNSCREW PIPE AND REMOVE FILTER FROM TANK

C. HYDRAULIC FILTER REMOVAL.

MEC 3895-272-12/3-72

Figure 3-72. Hydraulic tank, lines and fittings, removal and installation.



MEC 3895-273-12/3-78

Figure 3-73. Hydraulic piping diagram.

Section XIV. HOUSING, PANELS, PLATFORM, SEAT ASSEMBLY, INSTRUMENT PANEL AND TOOL BOX

3-116. Description

The drive roll housing covers the entire front end of the roller, and protects the drive roll assembly. The side covers, door, and brake inspection covers are secured to it. The platform upon which are located the operating controls, covers the transmission and linkages for the controls. The frame cover provides protection for the engine and hydraulic systems, and supports the instrument panel and some of the controls. A gear cover fastens to the frame on the left side of the roller, and protects the intermediate gear and pinion. Dust shield panels protect the under side of the roller at the rear end, over the steering roll assembly. The instrument panel houses all the instruments and manual switches.

3-117. Seat Assembly

a. Removal. Remove the seat assembly as instructed on figure 3-74.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear and damage. Replace worn or damaged parts.

c. Installation. Install the seat assembly in reverse of the instructions on figure 3-74.

3-118. Drive Roll Housing Assembly

a. Removal. Remove the housing from the roller as instructed on figure 3-75.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Replace worn, defective, or damaged parts.

c. Installation. Install the housing in reverse of the instructions on figure 3-75.

3-119. Panels, Covers, and Dirt Shields

a. Removal. Remove the panels, covers, and shields as instructed on figure 3-75.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Repair or replace worn, defective, or damaged parts.

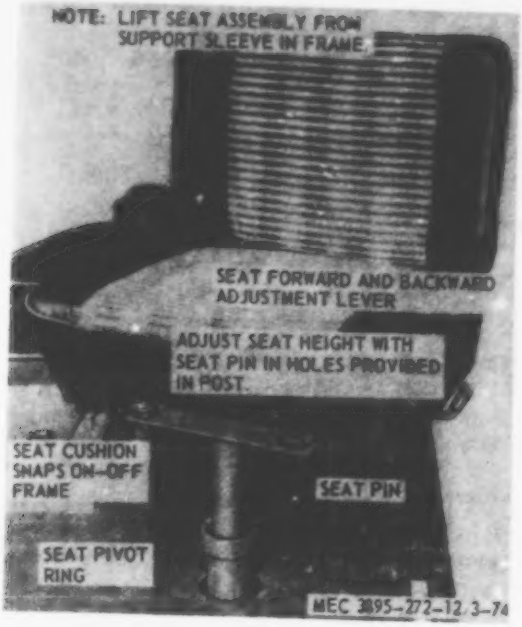

NOTE: LIFT SEAT ASSEMBLY FROM SUPPORT SLEEVE IN FRAME.
SEAT FORWARD AND BACKWARD ADJUSTMENT LEVER
ADJUST SEAT HEIGHT WITH SEAT PIN IN HOLES PROVIDED IN POST.
SEAT CUSHION SNAPS ON-OFF FRAME
SEAT PIN
SEAT PIVOT RING
MEC 3895-272-12/3-74

Figure 3-74. Seat assembly, removal and installation.

c. Installation. Install the panels, covers, and shields in reverse of the instructions on figure 3-75.

3-120. Instrument Panel

a. Removal. Remove the instrument panel and strip off the instruments, switches, and controls and lights as instructed on figure 3-64.

b. Cleaning, Inspection, and Repair.

(1) Clean the instrument panel in cleaning solvent.

(2) Inspect panel for damage or corrosion.

(3) Replace a badly damaged panel as required.

c. Installation. Install the controls, switches, and instruments on the instrument panel in reverse of the instructions on figure 3-64.

3-121. Platform

a. Removal.

(1) Disconnect linkage from service brake, parking brake, and sprinkler system pedals by removing pins from yokes on linkage rods (figure 3-76).

(2) Disconnect throttle linkage by removing nut from ball joint on throttle rod.

(3) Remove platform (figure 3-77).

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Replace worn, defective or damaged parts.

c. Installation.

(1) Install platform on roller frame in reverse of instructions on figure 3-77.

(2) Install linkage for service brake, parking brake, and sprinkler system pedals in reverse of instructions on figure 3-76.

3-122. Tool Box

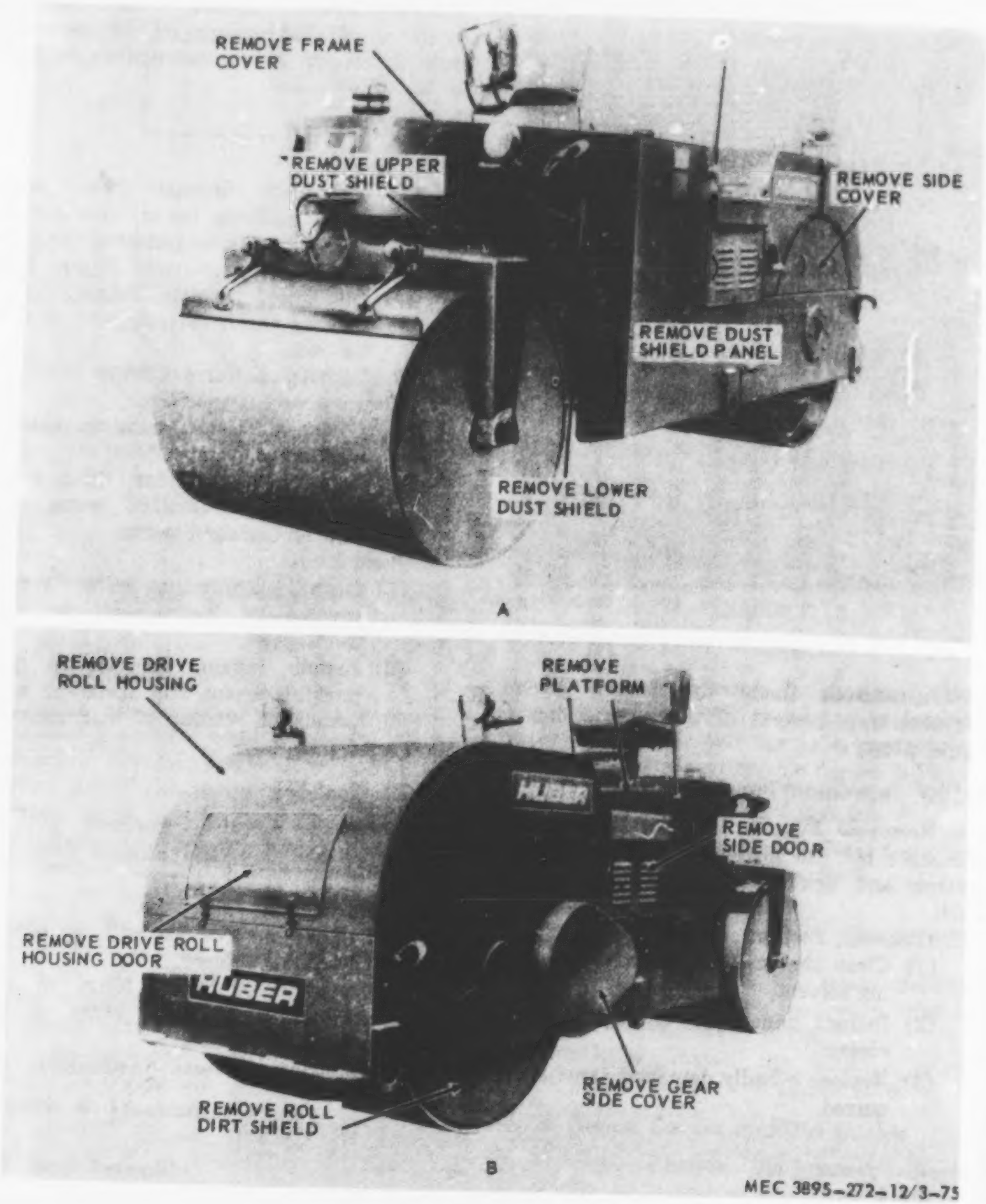
a. Removal. Remove capscrews (2) from bottom of tool box, and remove from roller (fig. 3-78).

b. Cleaning and Inspection.

(1) Clean the tool box with an approved cleaning solvent.

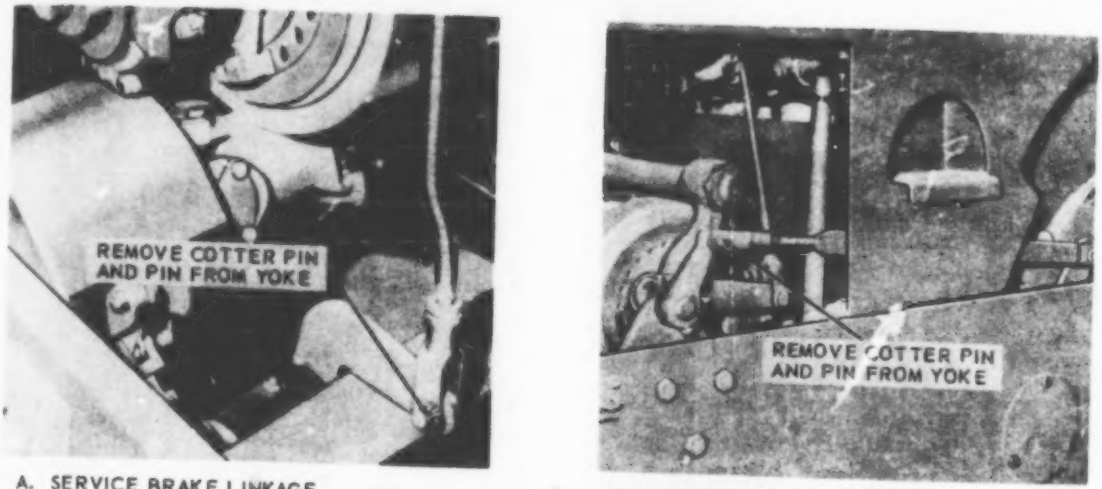
(2) Inspect for broken hinge or catch. Repair any welded joints or hardware as necessary.

c. Installation. Reverse instructions in *a* above.


REMOVE FRAME COVER
REMOVE UPPER DUST SHIELD
REMOVE SIDE COVER
REMOVE DUST SHIELD PANEL
REMOVE LOWER DUST SHIELD
A
REMOVE DRIVE ROLL HOUSING
REMOVE PLATFORM
HUBER
REMOVE SIDE DOOR
REMOVE DRIVE ROLL HOUSING DOOR
HUBER
REMOVE GEAR SIDE COVER
REMOVE ROLL DIRT SHIELD
B

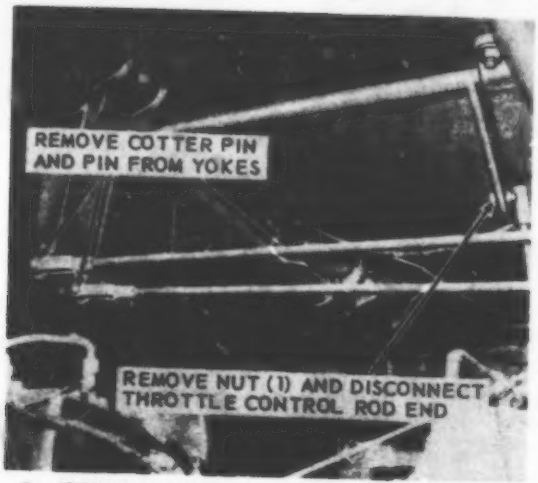
MEC 3895-272-12/3-75

Figure 3-75. Drive roll housing, panels, covers and dirt shields, removal and installation.


REMOVE COTTER PIN AND PIN FROM YOKE
REMOVE COTTER PIN AND PIN FROM YOKE

A. SERVICE BRAKE LINKAGE.

B. PARKING BRAKE LINKAGE


REMOVE COTTER PIN AND PIN FROM YOKES
REMOVE NUT (1) AND DISCONNECT THROTTLE CONTROL ROD END

C. SPRINKLER SYSTEM AND THROTTLE CONTROL RODS.

MEC 3895–272–12/3–76

Figure 3–76. Brake and sprinker linkage, removal and installation.

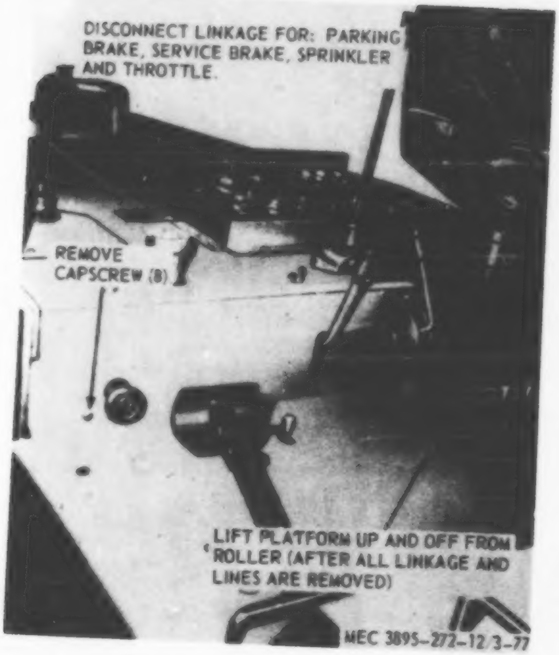

DISCONNECT LINKAGE FOR: PARKING BRAKE, SERVICE BRAKE, SPRINKLER AND THROTTLE.
REMOVE CAPSCREW (8)
LIFT PLATFORM UP AND OFF FROM ROLLER (AFTER ALL LINKAGE AND LINES ARE REMOVED)
MEC 3895-272-12/3-77

Figure 3-77. Platform, removal and installation.

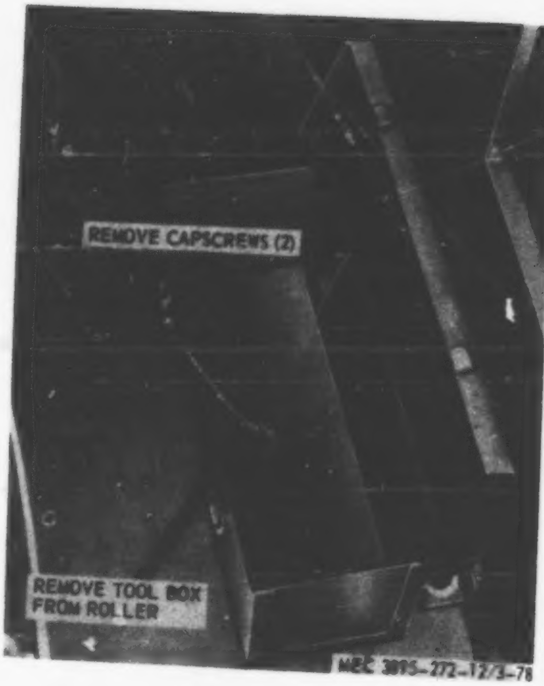

REMOVE CAPSCREWS (2)
REMOVE TOOL BOX FROM ROLLER
MEC 3895-272-12/3-78

Figure 3-78. Tool box, removal and installation.

Section XV. ROLLS AND ROLL SCRAPERS

3-123. Description

The rolls and roll scrapers consists of the guide roll, the drive roll, and the roll scrapers. The roll scrapers are equipped with adjustable tension springs to provide the necessary scraper pressure to properly clean the rolls. The roll bearings normally do not require frequent adjustment; looseness of a roll on its shaft generally indicates a damaged bearing. Roll bearings should be checked and adjusted every 1,000 hours.

3-124. Guide Roll Adjustment

a. For initial adjustment after maintenance on guide rolls, axle, or bearings, tighten capscrews equal number of turns at both ends of axle (fig. 3-79). Then tighten capscrews firmly at one end of axle. If extreme torque is applied to capscrews, the roll will bind. Secure adjustment with lockwire.

b. For periodic adjustment, remove lockwire and tighten capscrews at one end as instructed in *a.* above. Secure adjustment with lockwire.

3-125. Drive Roll Adjustment

a. To service the drive roll and axle assembly, usually an adjustment and lubrication of the bearings is all that is necessary.

b. Adjustment.

(1) Initial adjustment of drive roll bearings is done by turning adjusting screws on outside of adjusting plate clockwise to tighten the bearings, and counterclockwise to loosen the bearings (fig. 3-80).

Caution: EXERCISE CARE THAT THE ROLL WILL TURN FREELY AND YET WITHOUT ENDPLAY.

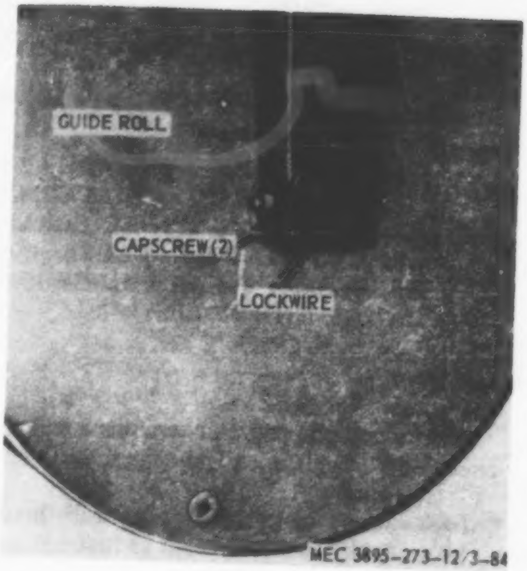

GUIDE ROLL
CAPSCREW (2)
LOCKWIRE
MEC 3895-273-12/3-84

Figure 3-79. Guide roll adjustment.

(2) Periodic check should be made for loose condition approximately every 1,000 hours of operation, and adjustment made to original position.

3-126. Roll Scrapers

a. Removal. Remove the roll scrapers as instructed on figure 3-81.

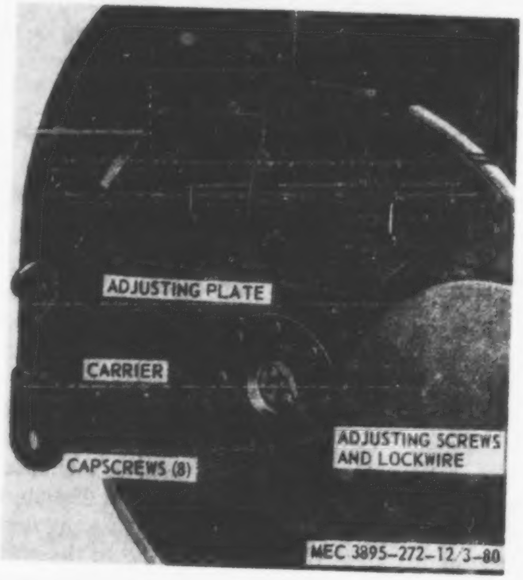
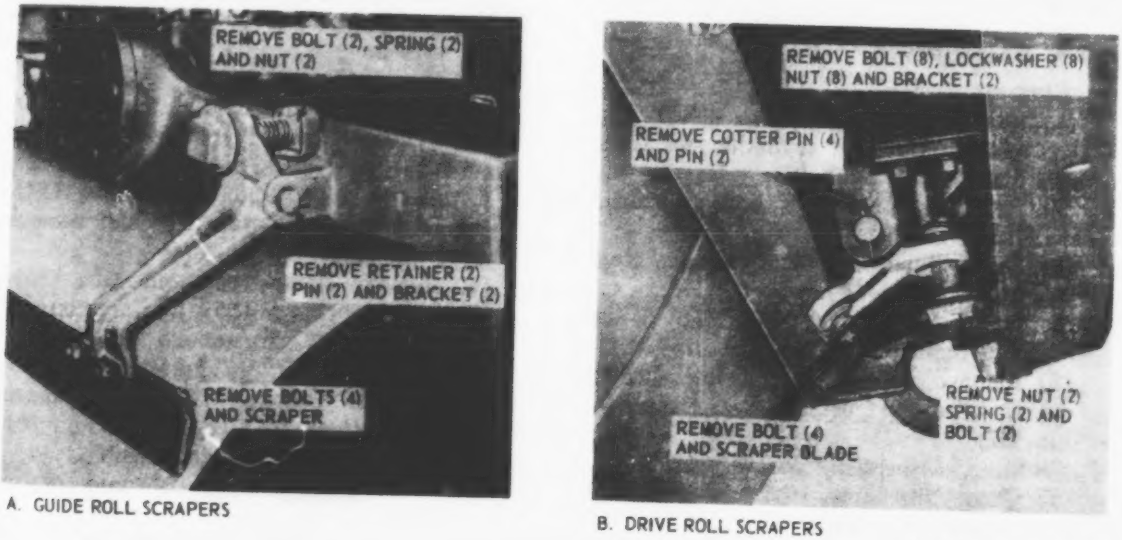

ADJUSTING PLATE
CARRIER
CAPSCREWS (8)
ADJUSTING SCREWS AND LOCKWIRE
MEC 3895-272-12/3-80

Figure 3-80. Drive roll adjustment.


REMOVE BOLT (2), SPRING (2) AND NUT (2)
REMOVE RETAINER (2) PIN (2) AND BRACKET (2)
REMOVE BOLTS (4) AND SCRAPER
REMOVE BOLT (8), LOCKWASHER (8) NUT (8) AND BRACKET (2)
REMOVE COTTER PIN (4) AND PIN (2)
REMOVE NUT (2) SPRING (2) AND BOLT (2)
REMOVE BOLT (4) AND SCRAPER BLADE

A. GUIDE ROLL SCRAPERS

B. DRIVE ROLL SCRAPERS

MEC 3895-272-12/3-81

Figure 3-81. Roll scrapers, removal and installation.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, and damage. Repair or replace worn, defective, or damaged parts.

c. Installation. Install the roll scrapers in reverse of the instructions on figure 3-81.

d. Adjustment.

(1) Guide roll adjustment. See figure 3-79.

Note. The scrapers should not be adjusted too tightly against the rolls, as excessive tension increases wear on the scraper blade.

(2) Drive roll adjustment. See figure 3-80.

Caution: **KEEP STONES OR ANY HARD OR ABRASIVE MATERIAL FROM LODGING UNDER SCRAPERS, AS IT WILL CAUSE UNNECESSARY WEAR AND GROOVING OF THE ROLLS.**

Section XVI. SPRINKLER SYSTEM

3-127. Description

The sprinkler system consists of a 130 gallon capacity tank, hose, piping, and cocoa mats. The front and rear spray bars are independently controlled by foot pedals located on the operator's platform. Water from the tank flows through piping and hose to the spray bars and cocoa mats. The cocoa mats distribute the water evenly across the rolls. This prevents bituminous materials from sticking to the rolls. The system can best be maintained by using clean, mineral-free water, and flushing the tank occasionally with an approved cleaning solution.

3-128. Water Tank

a. Removal.

(1) Remove plug (23, fig. 3-82). Depress guide roll sprinkler pedal to drain water tank.

(2) Remove side doors and platform (para 3-121).

(3) Drain fuel tank and remove fuel line (para 3-57).

(4) Disconnect adapter (11, fig. 3-82) and remove tee (22) and pipe (21).

(5) Remove drive roll housing (water tank) as instructed in paragraph 3-118.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solution.

(2) Inspect the tank for leaks and damage. Weld holes and cracks. Replace a badly damaged tank.

(3) Inspect the cap and strainer for damage. Replace a damaged cap and strainer.

c. Installation. Install the drive roll housing (water tank) in the reverse of instructions in paragraph 3-128*a*. above.

3-129. Sprinkler System Valves, Lines, Hoses and Fittings

a. Removal.

(1) Remove side doors, drive roll housing door, and upper dust shield panel (para 3-118).

(2) Remove plug (23, fig. 3-82) and depress sprinkler pedals to drain the system.

(3) Remove hose clamps (4) and hoses (3, 13, 29, and 36).

(4) Remove caps (37), sprinkler pipes (18), tees (17), nipples (16 and 42), elbows (15), and slip nipples (14).

(5) Disconnect adapter (11) and remove pipe (12).

(6) Remove clamp (35) and tube (30).

(7) Remove clamp (25) and disconnect adapter (11) to remove tube (24).

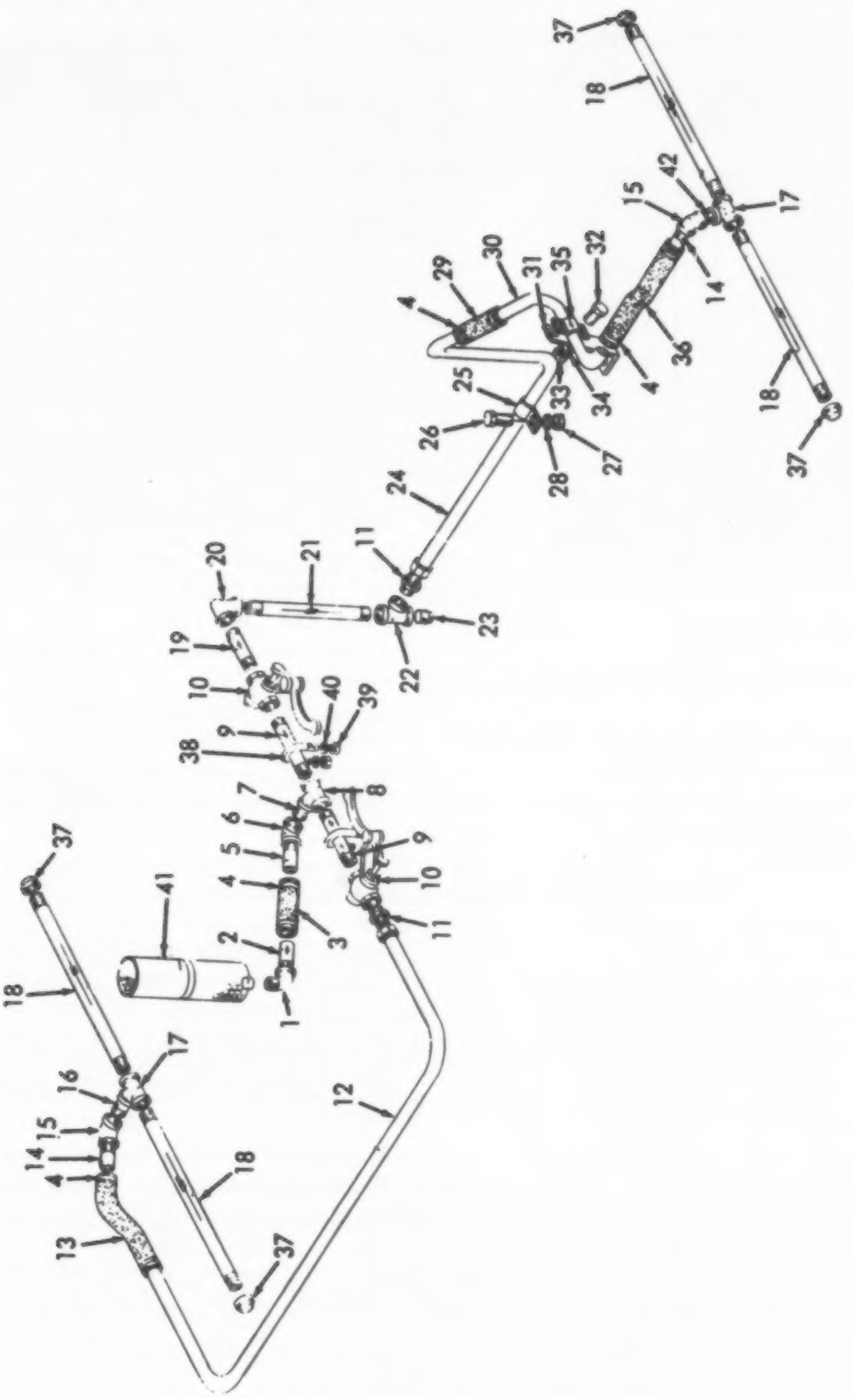
(8) Remove tee (22) and pipe (21).

(9) Remove U-bolts (38) and remove items (5, 6, 7, 8, 9, 10, 19, and 20) as a unit and then disassemble.

(10) Remove slip nipple (2) and elbow (1).

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.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MEC 3985-272-12/3-82

Figure 3–38. Sprinkler system, exploded view.

(2) Inspect all hoses for deterioration and damage.

(3) Check pipe for damage, scale deposits and leaks.

(4) Check valves for leaks and damage.

(5) Replace defective parts.

c. Installation. Install the sprinkler system lines and fittings in the reverse of instructions in paragraph 3-129 *a* (1) through (10).

d. Adjustment. Adjust sprinkler system valves and linkage (para 3-18).

Section XVII. TRANSMISSION

3-130. Description

The transmission assembly is located behind the engine and consists of the forward and reverse clutches, gears, and housing. The transmission is connected to the engine through the torque converter and transmits the engine torque to the drive roll.

3-131. Forward and Reverse Clutch Adjustment

Adjust the forward and reverse clutch as instructed in para 3-14.

3-132. Service Brake Adjustment

Adjust the service brake as instructed in para 3-15.

3-133. Transmission Levers and Linkage

a. Removal. Remove the transmission levers and linkage as instructed on figure 3-60.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with an approved cleaning solvent.

(2) Inspect all parts for wear, defects, or damage. Repair or replace worn, defective, or damaged parts.

c. Installation. Install the transmission levers and linkage in reverse of the instructions on figure 3-60.

3-134. Transmission Breather

a. Removal. Remove the transmission breather as instructed on figure 3-4.

b. Cleaning and Inspection.

(1) Clean the breather in an approved cleaning solvent.

(2) Inspect for damage. Replace an unserviceable filter.

c. Installation. Install the transmission breather in reverse of the instructions on figure 3-4.

Section XVIII. PARKING BRAKE

3-135. Description

The parking brake consists of a brake band which is tightened around a drum on the drive roll by application of the parking brake lever.

3-136. Parking Brake

a. Removal. Remove the parking brake from the drive roll as instructed on figure 3-83.

b. Cleaning, Inspection, and Repair.

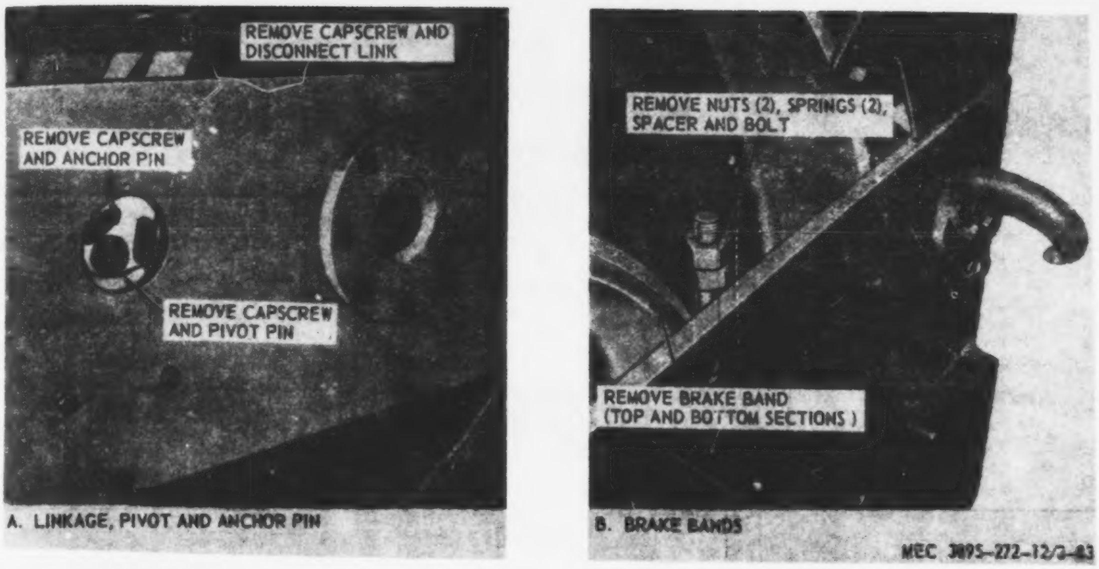
(1) Clean all parts with an approved cleaning solvent.

(2) Inspect the lining for wear and damage. Replace worn or damaged lining.

c. Installation.

(1) Install the parking brake in reverse of the instructions on figure 3-83.

(2) Adjust parking brake (para 3-16).


REMOVE CAPSCREW AND DISCONNECT LINK
REMOVE CAPSCREW AND ANCHOR PIN
REMOVE CAPSCREW AND PIVOT PIN
REMOVE NUTS (2), SPRINGS (2), SPACER AND BOLT
REMOVE BRAKE BAND (TOP AND BOTTOM SECTIONS)

A. LINKAGE, PIVOT AND ANCHOR PIN

B. BRAKE BANDS

MEC 3895-272-12/3-83

Figure 3-83. Parking brake, removal and installation.

Section XIX. STEERING YOKE AND KINGPIN ADJUSTMENT

3-137. Steering Yoke and Kingpin Adjustment

a. General. The steering yoke assembly and kingpin assembly are located at the rear of the roller, and provide the steering mechanism. The guide rolls are attached to the steering yoke assembly which in turn is connected to the kingpin assembly. Bearings in the yoke and kingpin do not require frequent adjustment; looseness generally indicates a damaged bearing. Bearings should be checked and adjusted every 1000 hours.

b. Yoke Swivel Bearing Adjustment.

(1) Remove six capscrews (7, fig. 3-84), washers (14), cover (8), gasket (9) from retainer (13).

(2) Remove lockwire (10) from adjusting bolts (11). Tighten adjusting bolts evenly to prevent loading bearings unevenly. Tighten bolts to obtain 20 to 24 inch-pounds drag at the swivel.

(3) Secure adjusting bolts (11) with lockwire (10). Install gasket (9), cover (8), washers (14), and capscrews (7).

c. Kingpin Adjustment.

(1) Remove lockwire (1) from heads of capscrews (2).

(2) Tighten the three capscrews (2) evenly to obtain 20—24 inch-pounds drag at the kingpin. Secure the capscrews with lockwire.

(3) Tighten nuts (4) on capscrews (6) to lock arm (15) in position.

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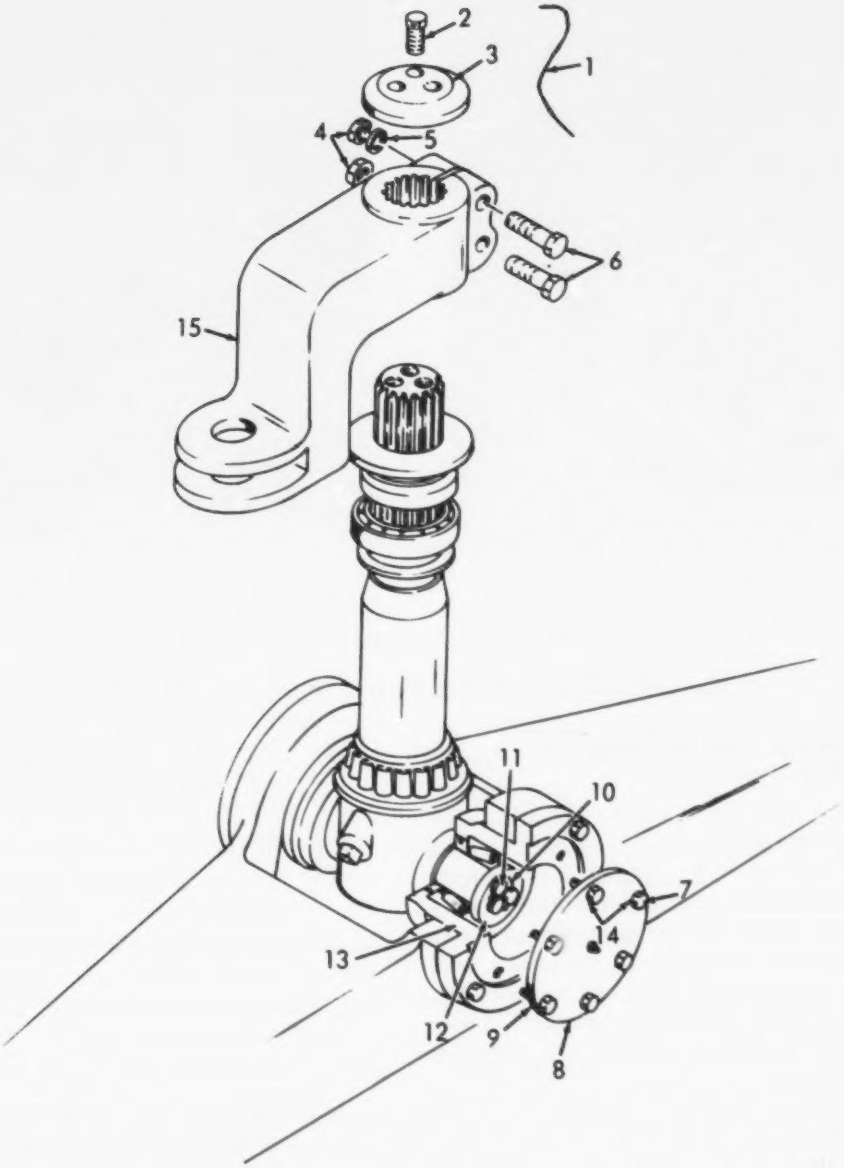
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MEC 3895-273-12/3-92

Figure 3-84. Steering yoke bearing and kingpin adjustment.

APPENDIX A

REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguisher for Army Use.

A-2. Lubrication

C9100-IL	Petroleum, Petroleum-Base Products, and Related Materials.
LO 5-3895-272-12	Lubrication Order.

A-3. Painting

TM 9-213	Painting Instructions for Field

A-4. Maintenance

TM 9-6140-200-15	Storage Batteries, Lead-Acid Type.
TM 38-750	Army Equipment Record Procedures.
TB ENG 347 (Used only when published)	Winterization Techniques for Engineer Equipment.
TM 5-3895-272-20P	Orgizational Maintenance Repair Parts and Special Tools List

APPENDIX B

BASIC ISSUE ITEMS LIST, MAINTENANCE AND OPERATING SUPPLIES

Section I. INTRODUCTION

B-1. General

Section II lists the accessories, tools, and publications required for maintenance and operation by the operator which are initially issued with, or authorized for use with the (5 to 8 ton tandem roller). Section III lists the maintenance and operating supplies required for initial operation.

B-2. Explanation of Columns Contained in Section II

a. Source Codes. The information provided in each column is as follows:

(1) *Materiel.* This column is left blank. For identification of agencies assigned supply responsibility for parts, refer to appropriate Federal and Department of Army supply catalogs.

(2) *Source.* The selection status and source of supply for each part are indicated by one of the following code symbols:

(*a*) P—applied to high-mortality repair parts which are stocked in or supplied from the army supply system, and authorized for use at indicated maintenance categories.

(*b*) P1—applied to repair parts which are low-mortality parts, stocked in or supplied from supply service depots, and authorized for installation at indicated maintenance level.

(*c*) M—applied to repair parts which are not procured or stocked but are to be manufactured at indicated maintenance level.

(*d*) X2—applied to repair parts which are not stocked. The indicated maintenance level requiring such parts will attempt to obtain them through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with supporting justification through normal supply channels.

(3) *Maintenance.* The lowest maintenance level authorized to use, stock, install, or manufacture the part is indicated by the following code symbol.

O—Organizational Maintenance

(4) *Recoverability.* Repair parts and/or tool and equipment items that are recoverable are indicated by one of the following code symbols.

(*a*) R—applied to repair parts and assemblies which are economically repairable at direct and general support maintenance activities and normally are furnished by supply on exchange basis.

(*b*) T—applied to high-dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance facilities.

(c) U—applied to repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high-dollar value reusable casings, castings, and the like.

Note. When no code is shown in the recoverability column the part is considered expendable.

b. *Federal Stock Number.* When a Federal stock number is available for a part, it will be shown in this column, and will be used for requisitioning purposes.

c. *Description.*

(1) The item name and a brief description of the part are shown.

(2) A five-digit Federal supply code for manufacturers and/or other supply services is shown in parentheses followed by the manufacturer's part number. This number shall be used for requisitioning purposes when no Federal stock number is indicated in the Federal stock number column.

Example: (08645) 86453

d. *Unit of Issue.* If no abbreviation is shown in this column, the unit of issue is "each".

e. *Quantity Authorized.* This column lists the quantities of repair parts, accessories, tools, or publications authorized for issue to the equipment operator or crew as required.

f. *Quantity Issued with Equipment.* This column lists the quantities of repair parts, accessories, tools, or publications that are initially issued with each item of equipment. Those indicated by an asterisk are to be requisitioned through normal supply channels as required.

g. *Illustrations.* This column is subdivided into two columns which provide the following information:

(1) *Figure number.* Provides the identifying number of the illustration.

(2) *Item number.* Provides the reference number for the parts shown in the illustration.

B-3. Explanation of Columns Contained in Section III

a. *Item.* This column contains numerical sequenced item numbers, assigned to each component application, to facilitate reference.

b. *Component Application.* This column identifies the component application of each maintenance or operating supply item.

c. *Source of Supply.* This column is left blank. For identification of agencies assigned supply responsibility for parts, refer to appropriate Federal and Department of Army Supply Catalogs.

d. *Federal Stock Number.* The Federal stock number will be shown in this column and will be used for requisitioning purposes.

e. *Description.* The item and a brief description are shown.

f. *Quantity Required for Initial Operation.* This column lists the quantity of each maintenance or operating supply item required for initial operation of the equipment.

g. *Quantity Required for Eight Hours Operation.* Quantities listed represent the estimated requirements for an average eight hours of operation.

h. *Notes.* This column contains informative notes keyed to data appearing in the preceding column.

Section II. BASIC ISSUE ITEMS LIST

Source codes				Federal stock number	Description	Unit of issue	Quantity authorized	Quantity issued with equipment	Illustration	
Material	Source	Maintenance	Recoverability						Figure	Item
					GROUP 06 ELECTRICAL SYSTEM 0612 BATTERIES					
09	P	O		6140-057-2554	BATTERIES		2	2		
03	P1	O		6810-249-9364	ELECTROLITE	GAL	4	4		
					GROUP 31—BASIC ISSUE ITEMS, MANUFACTURER INSTALLED 3100 BASIC ISSUE ITEMS, MANUFACTURER OR DEPOT INSTALLED					
	P	O		7520-559-9618	CASE: Operations & Maintenance Publications, Cotton-duck, water repellent & mildew resistant. MIL-B-11743B (GE).		1	1		
12					LO 5-3895-272-12 Lubrication Order.		1	1		
12					TM 5-3895-272-12 Operator & Organizational Maintenance Manual.		2	2		
12					TM 5-3895-272-20P Organizational Maintenance Repair Parts.	1	2	2		
12					TM 5-3895-272-35 Direct and General Support and Depot Maintenance Manual.		2			
					TM 5-3895-272-35P Direct and General Support and Depot Maintenance Repair Parts.		2			
					GROUP 32—BASIC ISSUE ITEMS TROOP INSTALLED 3200 BASIC ISSUE ITEMS TROOP INSTALLED OR AUTHORIZED					
10	P	O		4930-360-2801	GREASE, GUN: hand, lever operated, 16 ounce capacity extension 7 in. lg, and hydraulic coupler MIL-G-3859.		1	*		
10	P	O		5120-242-3971	HAMMER, HAND: 1 LB. Machinists		1	*		
10	P	O		4930-168-3252	OILER, HAND: force fed by internal pump 8 ounce capacity.		1	*		
10	P	O		5120-233-3796	PLIERS, SLIP JOINT: straight nose combination w/cutter, 6 in. long.		1	*		
10	P	O		5120-234-8910	SCREWDRIVER, FLAT TIP: plastic handle 5/16 in., tip, 6 in. long.		1	*		
10	P	O		5120-264-3796	WRENCH, OPEN END, ADJUSTABLE: 0" to 1 5/16 in. jaw opening, 12 in. long.		1	*		
					GROUP 76—FIRE FIGHTING EQUIPMENT 7603 FIRE EXTINGUISHERS					
	P	O		4210-893-1092	EXTINGUSHERS, FIRE: dry type, w/bracket, Wall (GE) 2 1/2 lb. capacity.		1	1		

Section III. MAINTENANCE AND OPERATING SUPPLIES

(1) Item	(2) Component application	(3) Federal stock number	(4) Description	(5) Quantity required f/initial operation	(6) Quantity required f/8 hrs operation	(7) Notes
1.	0101 CRANKCASE (1)		OIL, LUBRICATING			(1) Includes quantity of oil to fill engine oil system as follows: 5 qt.—crankcase 1 qt—oil filter
			5 gal pails as follows:			
		9150-265-9435(2)	OE-30	5 qt.	(3)	
		9150-265-9428(2)	OE-10		(3)	
		9150-242-7603(2)	OES		(3)	
2.	0203 TORQUE CONVERTER		OIL, LUBRICATING: (4)	7 1/2 qt.	(3)	(2) See C9100-IL for additional data and requisitioning procedure.
			OE-10		(3)	
			OES		(3)	
3.	0304 AIR CLEANER		OIL, LUBRICATING: (4)	1 qt.		(3) See current LO for grade application and replenishment intervals.
			OE-30		(3)	
			OE-10		(3)	
			OES		(3)	
1	0306 TAN, FUEL		FUEL, GASOLINE: bulk as follows:			(4) Use oil as prescribed in item 1.
		9130-160-1818	automotive, combat 91A	25.5 (5)	40 gal. (6)	
		9130-160-1830	automotive, combat 91C			
5.	0501 RADIATOR		WATER:	16 qt.		(5) Tank capacity
			ANTIFREEZE: 5 gal. cans as follows:			
		6850-224-8730	antifreeze ethylene glycol	11 qt.		
			ANTIFREEZE: 55 gal. drums as follows:			
		6850-174-1806	Antifreeze: compound, artic	16 qt.		
6.	0800 TRANSMISSION		LUBRICATING OIL, GEAR 5 gal. cans as follows:			(6) Average fuel consumption is 5.0 gal. per hour of continuous operation.
		9150-577-5844	GO-90	9 qt. (5)	(3)	
		9150-257-5440	GOS		(3)	
7	1103 FINAL DRIVE GEARS	9150-234-5197(2) 9150-234-5199(2)	OIL, LUBRICATING, GEAR 5-lb. can as follows:			
			CW-11A	5 lb	(3)	
			CW-11B	5 lb	(3)	

(1) Item	(2) Component application	(3) Federal stock number	(4) Description	(5) Quantity required f/initial operation	(6) Quantity required f/8 hrs operation	(7) Notes
8.	1413 HYDRAULIC SYSTEM		OIL, LUBRICATING: (1) OE-10 OES	26 qt. (5)	(3)	
9.	7171 SPRINKLER SUPPLY TANK		WATER	130 gal.		
10.	GREASE POINTS	9150-190-0905(2)	GREASE, AUTOMOTIVE AND ARTILLERY: (3) 5-lb. can as follows: GAA	5 lb	1 lb	

APPENDIX C

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance operations on the identified end item or component. The implementation of the maintenance tasks upon the end item or component will be consistent with the assigned maintenance operations.

c. Section III lists the special tools and test equipment required for each maintenance operation as referenced from Section II.

d. Section IV contains supplemental instructions, explanatory notes and/or illustrations required for a particular maintenance function.

2. Explanation of Columns in Section II

a. Functional Group Number. The functional group is a numerical group set up on a functional basis. The applicable functional grouping indexes (obtained from TB 750-93-1, Functional Grouping Codes) are listed on the Maintenance Assignment in the appropriate numerical sequence. These indexes are normally set up in accordance with their function and proximity to each other.

b. Component Assembly Nomenclature. This column contains a brief description of the components of each functional group.

c. Maintenance Functions and Maintenance Categories This column lists the various maintenance functions (A through K) and indicates the lowest maintenance category authorized to perform these operations. The symbol designations for the various maintenance categories are as follows:

C—Operator or crew
O—Organizational maintenance
F—Direct support maintenance
H—General support maintenance
D—Depot maintenance

The maintenance functions are defined as follows:

A—INSPECT: Verify serviceability and detect incipient electrical or mechanical failure by close visual examination.

B—TEST: Verify serviceability and detect incipient electrical or mechanical failure by measuring the mechanical or electrical characteristics of the item and comparing those characteristics with authorized standards. Tests will be made commensurate with test procedures and with calibrated tools and/or test equipment referenced in the Maintenance Assignment.

C—SERVICE: Operations required periodically to keep the item in proper operating condition, i.e., to clean, preserve, drain, paint, and replenish fuel, lubricants, hydraulic, and deicing fluids or compressed air supplies.

D—ADJUST: Regulate periodically to prevent malfunction. Adjustments will be made commensurate with adjustment procedures and associated equipment adjustment specifications.

E—ALINE: Adjust two or more components of an electrical or mechanical system so that their functions are properly synchronized or adjusted.

F—CALIBRATE: Determine, check, or rectify the graduation of an instrument, weapon, or weapons system or components of a weapons system.

G—INSTALL: Remove and install the same item for service or when required for the performance of other maintenance operations.

H—REPLACE: Substitute serviceable components, assemblies and subassemblies for unserviceable counterparts.

I—REPAIR: Restore to a serviceable condition by replacing unserviceable parts or by any other action required using available tools, equipment and skills, including welding, grinding, riveting, straightening, adjusting and facing.

J—OVERHAUL: Restore an item to a completely serviceable condition (as prescribed by serviceability standards developed and published by the commodity commands) by employing techniques of "Inspect and Repair Only as Necessary" (IROAN). Maximum use of diagnostic and test equipment is combined with minimum disassembly during overhaul. "Overhaul" may be assigned to any level of maintenance except organizational, provided the time, tools, equipment, repair parts authorization, and technical skills are available at that level. Normally, overhaul as applied to end items, is limited to depot maintenance level.

K—REBUILD: Restore to a condition comparable to new by disassembling to determine the condition of each component part and reassembling using serviceable, rebuilt or new assemblies, subassemblies, and parts.

d. Notes Reference. This column, subdivided into columns L and M, is provided for referencing the Special Tool and Test Equipment Requirements (Sec. III) and Remarks (Sec. IV) that may be associated with maintenance functions (Sec. II).

3. Explanation of Columns in Section III

a. Reference Code. This column consists of a number and a letter separated by a dash. The number references the T and TE requirements column on the Maintenance Assignment. The letter represents the specific maintenance function the item is to be used with. The letter is representative of columns A through K on the Maintenance Assignment.

b. Maintenance Category. This column shows the lowest level of maintenance authorized to use the special tool or test equipment.

c. Nomenclature. This column lists the name or identification of the tool or test equipment.

d. Tool Number. This column lists the manufacturer's code and part number, or Federal stock number of tools and test equipment.

4. Explanation of Columns in Section IV

a. Reference Code. This column consists of two letters separated by a dash, both of which are references to Section II. The first letter references column M and the second letter references a maintenance operation, columns A through K.

b. Remarks. This column lists information pertinent to the maintenance operation being performed, as indicated on the Maintenance Assignment Section II.

Section II. MAINTENANCE ASSIGNMENT

Functional group number	Component assembly nomenclature	Maintenance functions											Note reference	
		A	B	C	D	E	F	G	H	I	J	K	L	M
		INSPECT	TEST	SERVICE	ADJUST	ALINE	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	Tools and Equipment	Remarks
01	ENGINE													
0100	ENGINE ASSEMBLY	C	O	C	--	--	--	--	F	O	D	D	--	A
0101	CRANKCASE, BLOCK, CYLINDER HEAD													
	Block, cylinder	--	--	--	--	--	--	--	H	H				
	Head, cylinder	--	--	--	--	--	--	--	O					
0102	CRANKSHAFT	--	--	--	--	--	--	--	H					
	Bearings	--	--	--	--	--	--	--	H					
	Pulley	--	--	--	--	--	--	--	O					
0103	FLYWHEEL ASSEMBLY	--	--	--	--	--	--	--	H	H				
	Housing	--	--	--	--	--	--	--	H	O				
	Plates, gaskets & cover	--	--	--	--	--	--	--	O	--	--	--	--	B
0104	PISTONS, CONNECTING RODS													
	Pistons, rings, pins, bushings	--	--	--	--	--	--	--	H					
	Rods, connecting	--	--	--	--	--	--	--	H	H				
	Bearings	--	--	--	--	--	--	--	H					
0105	VALVES, CAMSHAFT AND TIMING SYSTEM													
	Valves	--	--	--	--	--	--	--	F	F				
	Springs, guides & locks	--	--	--	--	--	--	--	F					
	Seats, insert	--	--	--	--	--	--	--	F	F				
	ROCKER ARMS, TAPPETS													
	Tappets	--	--	--	O	--	--	--	F					
	Covers & gaskets	--	--	--	--	--	--	--	O					
	CAMSHAFT	--	--	--	--	--	--	--	H					
	Bearings	--	--	--	--	--	--	--	H					
	TIMING GEARS	--	--	--	--	--	--	--	H	H				
	Covers & gaskets	--	--	--	--	--	--	--	H					
0106	ENGINE LUBRICATION SYSTEM													
	Pump, oil	--	--	--	--	--	--	--	F	F				
	Filter, oil	--	--	C	--	--	--	--	O					
	Fittings	--	--	--	--	--	--	--	O					
	Valve, relief	--	--	--	O	--	--	--	O					
	Cap, filler; gage, level	--	--	--	--	--	--	--	C					
	Lines	--	--	--	--	--	--	--	O	O				
	Pan, oil	--	--	--	--	--	--	--	F					
0108	MANIFOLDS	--	--	--	--	--	--	--	O	O				
03	FUEL SYSTEM													
0301	CARBURETOR													
	Carburetor	--	--	O	C	--	--	--	O	F				
	Gasket, bowl	--	--	--	--	--	--	--	O					
0302	FUEL PUMP	--	--	--	--	--	--	--	O					
0304	AIR CLEANER	--	--	C	--	--	--	--	O					
0306	TANK, LINES, FITTINGS, FUEL													
	Tank	--	--	C	--	--	--	--	O	F				
	Lines	--	--	--	--	--	--	--	O	O				

Functional group number	Component assembly nomenclature	Maintenance functions											Note reference	
		A	B	C	D	E	F	G	H	I	J	K	L	M
		INSPECT	TEST	SERVICE	ADJUST	ALINE	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	Tools and Equipment	Remarks
	Fitting	--	--	--	--	--	--	--	O					
	Cap	--	--	--	--	--	--	--	O					
0308	ENGINE SPEED GOVERNOR	--	--	--	O	--	--	--	O	F				
	Linkage	--	--	--	--	--	--	--	O					
	Governor controls	--	--	--	--	--	--	--	O					
0309	FUEL FILTER	--	--	C	--	--	--	--	O	O				
0312	ACCELERATOR, THROTTLE OR CHOKE CONTROLS													
	Control, throttle, & choke	--	--	--	--	--	--	--	O					
04	EXHAUST SYSTEM													
0401	MUFFLER AND PIPES	--	--	--	--	--	--	--	O					
05	COOLING SYSTEM													
0501	RADIATOR	C	--	C	--	--	--	--	O	F	--	--	--	C
	Cap	--	--	--	--	--	--	--	C					
0503	THERMOSTAT, HOUSING, AND GASKET													
	Thermostat		O	--	--	--	--	--	O					
	Housing, thermostat; hoses; clamps	--	--	--	--	--	--	--	O					
0504	WATER PUMP	--	--	--	--	--	--	--	O					
	Packing	--	--	--	O	--	--	--	O					
0505	FAN ASSEMBLY	--	--	--	--	--	--	--	O	O				
	Blade, fan; guard	--	--	--	--	--	--	--	O					
	Belt, fan	--	--	--	C	--	--	--	O					
06	ELECTRICAL SYSTEM (ENGINE & VEHICULAR)													
0601	GENERATOR	--	O	--	--	--	--	--	O	F				
	Brushes	--	--	--	--	--	--	--	O					
0602	GENERATOR REGULATOR (VOLTAGE).	--	O	--	O	--	--	--	O					
0603	STARTING MOTOR	--	O	O	--	--	--	--	O	F				
	Solenoid	--	--	--	--	--	--	--	O					
0605	IGNITION COMPONENTS													
	Magneto	--	--	O	O	--	--	--	O	F				
	Spark plugs	--	O	O	O	--	--	--	O					
	Points; condenser; cables	--	--	--	--	--	--	--	O					
0606	ENGINE SAFETY CONTROL													
	Overspeed governor	--	--	--	--	--	--	--	O	F				
0607	INSTRUMENT OR ENGINE CONTROL PANEL													
	Panel	--	--	--	--	--	--	--	O	O				
	Switch	--	--	--	--	--	--	--	O					
	Gages, electrical	--	--	--	--	--	--	--	O					
	Wiring	--	--	--	--	--	--	--	--	O				
	Lamps	--	--	--	--	--	--	--	C					
0609	LIGHTS: RINGS: GASKETS: SEAL BEAM	--	--	--	--	--	--	--	O					
0610	SENDING UNITS	--	--	--	--	--	--	--	O					

Functional group number	Component assembly nomenclature	Maintenance functions											Note reference	
		A	B	C	D	E	F	G	H	I	J	K	L	M
		INSPECT	TEST	SERVICE	ADJUST	ALINE	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	Tools and Equipment	Remarks
0612	BATTERIES													
	Batteries	--	O	C	--	--	--	--	O					
	Cables, battery	--	--	--	--	--	--	--	O	O				
	Box, battery	--	--	--	--	--	--	--	O					
0613	CHASSIS WIRING HARNESS													
	Wiring Harness	--	--	--	--	--	--	--	--	O				
07	TRANSMISSION													
0700	TRANSMISSION ASSEMBLY (Main and/or Secondary)													
	TRANSMISSION CASE	C	--	C	--	--	--	--	H					
0701	TRANSMISSION SHAFTS													
	Shafts; gears; bearing	--	--	--	--	--	--	--	H					
0703	TRANSMISSION CLUTCH AND CLUTCH CONTROLS													
	Clutches	--	--	--	C	--	--	--	--	F				
	Controls	--	--	C	--	--	--	--	O	--	--	--	--	D
0704	TRANSMISSION TOP COVER ASSEMBLY													
	Cover, shifter	--	--	--	--	--	--	--	F					
	Rods and lever, control	--	--	--	--	--	--	--	O					
0707	TRANSMISSION BRAKE													
	Brake, transmission	--	--	--	O	--	--	--	F	F				
	Rods, pedal; levers	--	--	--	--	--	--	--	O					
0708	TORQUE CONVERTER	--	--	C	--	--	--	--	H	H	H			
0721	PUMP													
	Oil distribution	--	--	--	--	--	--	--	--	H				
	Lines	--	--	--	--	--	--	--	O	F				
	Fittings	--	--	--	--	--	--	--	O					
11	REAR AXLE													
1103	FINAL DRIVE													
	Intermediate drive assembly	--	--	C	--	--	--	--	F	F				
	Pinion shaft assembly	--	--	--	--	--	--	--	F					
	Universal joint	--	--	--	--	--	--	--	F					
	Bearings; seals; axle	--	--	--	--	--	--	--	F					
12	BRAKES													
1201	HAND BRAKES													
	Brakes, hand	--	--	--	C	--	--	--	O	F				
	Lever	--	--	--	--	--	--	--	O					
	Linkage	--	--	--	--	--	--	--	F					
14	STEERING													
1401	STEERING ASSEMBLY													
	Steering lever and linkage	--	--	--	--	--	--	--	O					
1405	STEERING YOKES													
	Yoke; kingpin; bearings	--	--	C	--	--	--	--	F	F				
1410	PUMP AND PUMP DRIVE													
	Hydraulic pump	--	--	--	--	--	--	--	O	F				
	Pump drive belt	--	--	--	C	--	--	--	O					
	Pulley, bracket	--	--	--	--	--	--	--	O					

Functional group number	Component assembly nomenclature	Maintenance functions											Note reference	
		A	B	C	D	E	F	G	H	I	J	K	L	M
		INSPECT	TEST	SERVICE	ADJUST	ALINE	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	Tools and Equipment	Remarks
1411	HOSES, LINES, FITTINGS													
	Hose, lines	--	--	--	--	--	--	--	O	F				
	Fittings	--	--	--	--	--	--	--	O					
1412	HYDRAULIC CYLINDER													
	Cylinder, steering	--	--	--	--	--	--	--	O	F				
1413	TANKS, RESERVOIRS													
	Hydraulic oil tank	--	--	C	--	--	--	--	O					
	Cap	--	--	--	--	--	--	--	C					
1414	STEERING SYSTEM VALVES													
	Valve, control	--	--	--	O	--	--	--	O					
	Pressure regulator	--	--	--	O	--	--	--	O					
15	FRAME													
1501	FRAME ASSEMBLY													
	Frame	--	--	--	--	--	--	--	H	F				
	Handrail	--	--	--	--	--	--	--	O					
18	BODY CAB, HOOD AND HULL													
1801	DRIVE ROLL HOUSING ASSEMBLY	--	--	--	--	--	--	--	O	O				
1806	SEAT	--	--	--	--	--	--	--	O					
1808	TOOL BOX	--	--	--	--	--	--	--	O					
1808	PLATFORM	--	--	--	--	--	--	--	O	--	--	--	--	E
22	MISCELLANEOUS ITEMS													
2210	DATA PLATES AND INSTRUCTION HOLDERS													
	Plates, data	--	--	--	--	--	--	--	F					
	Plates, instruction	--	--	--	--	--	--	--	O					
31	BASIC ISSUE ITEMS, MANUFACTURER INSTALLED													
3100	BASIC ISSUE ITEMS, MANUFACTURER OR DEPOT INSTALLED													
	Publications, case	--	--	--	--	--	--	--	C					
	Light, trouble	--	--	--	--	--	--	--	C					
	Case, rifle	--	--	--	--	--	--	--	C					
	Binder, log book	--	--	--	--	--	--	--	C					
32	BASIC ISSUE ITEMS, TROOP INSTALLED													
3200	BASIC ISSUE ITEMS TROOP INSTALLED OR AUTHORIZED													
	Tools, common	--	--	--	--	--	--	--	C					
47														
4702	GAGES													
	Gages	--	--	--	--	--	--	--	C					
74	CRANES SHOVELS AND EARTH MOVING EQUIPMENT COMPONENTS													
7466	STEERING ROLLS	--	--	C	--	--	--	--	F	F				
7468	DRIVE ROLLS	--	--	C	--	--	--	--	F	F				
7470	ROLL SCRAPERS	--	--	--	--	--	--	--	O	O				
	Shaft, spring, blade	--	--	--	--	--	--	--	O					
	Bracket assembly, scraper	--	--	--	--	--	--	--	O					

Functional group number	Component assembly nomenclature	Maintenance functions											Note reference	
		A	B	C	D	E	F	G	H	I	J	K	L	M
		INSPECT	TEST	SERVICE	ADJUST	ALINE	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	Tools and Equipment	Remarks
7471	SPRINKLER SYSTEM													
	Tank	C	--	C	--	--	--	--	O					
	Pipes; fittings; valves	--	--	--	--	--	--	--	O	O				
	Mat assembly	--	--	--	--	--	--	--	O					
76	FIRE FIGHTING EQUIPMENT													
7603	FIRE EXTINGUISHER	--	--	--	--	--	--	--	C					
	Extinguisher, fire	--	--	C	--	--	--	--	C					

Section III. SPECIAL TOOL AND SPECIAL TEST EQUIPMENT REQUIREMENTS

Reference code	Maintenance level	Nomenclature	Tool number
		No Special Tools Required	

Section IV. REMARKS

Reference code	Remarks
A-B	Test of engine includes operation and compression
B-I	Replace inspection plate gasket hardware
C-I	Locate leaks and repair using solder
D-H	Replace any bent rods; badly worn or broken ball joints
E-H	Repair or replace bent or broken tool box lid

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Adjustment:		
Belts		
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By Order of the Secretary of the Army:

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For explanation of abbreviations used, see AR 320-50.

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